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Spectrum
Engineering (Firm)
Bannack State
Park Project,
Beaverhead County,
Montana

BANNACK STATE PARK PROJECT

DSL - AMRB No. 91-006

FINAL REPORT

Beaverhead County, Montana



January 27th, 1992

SPECTRUM ENGINEERING

Billings, Montana



SPECTRUM ENGINEERING
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FINAL REPORT

BANNACK STATE PARK PROJECT DSL - AMRB No. 91-006

Beaverhead County, Montana

Located in Southwestern Montana

in T8S, R11W, Section 7

PAGE ONE OF
PLAT SHEET NUMBER 1

January 27th, 1992

Spectrum Engineering
Billings, Montana



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BANNACK STATE PARK PROJECT

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1. INTRODUCTION

1.1 Project Description

The Bannack State Park AML project in southwestern Montana was totally contained within the Bannack State Park in Beaverhead County near Dillon.

The Apex Mill is an historical structure that the Department of Fish, Wildlife, and Parks (DFWP) wanted to rehabilitate, so that tourists can tour the building. The state of deterioration made the building unstable and unsafe. The goal was, therefore, to rehabilitate the building for historic preservation purposes, and to make it safe for DFWP guided tours.

Outside of the mill building are tailing dumps covering over 3 acres. The tailings contain some lead, gold, silver, and copper, but the quantities and soil chemistry are such that they are not considered hazardous by EPA standards. Environmentally, wastes associated with the mines (waste and tailings dumps) do not support vegetation and are subject to erosive forces. The tailings dump at the Apex Mill had been subject to rilling and gullying, as evidenced by its current topography. The goal of reclamation was to subtly regrade the tailings to eliminate the erosion problem, but to preserve the appearance and texture of the tailings. Accomplishment of this task would allow Park visitors to experience an actual historical mining and milling site.

1.1.1 Location and Access

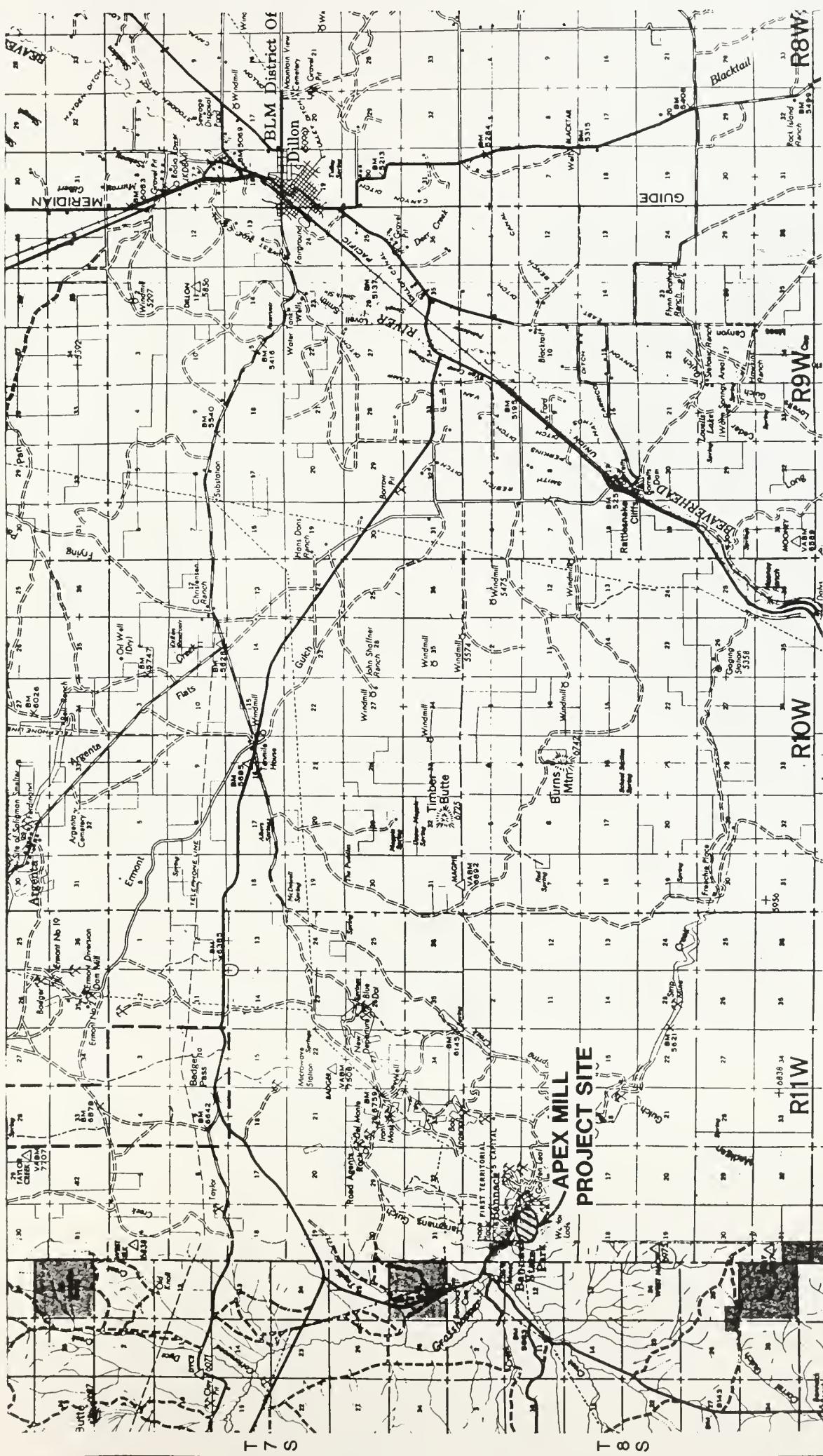
The project location was in T8S, R11W, Section 7-NW $\frac{1}{4}$ on the patented mining claim called Hendricks Lode (MS 5407) and the Hendricks Mill Site Claim in Beaverhead County, Montana. The mine is found on the 7 $\frac{1}{2}$ minute USGS quadrangle named Bannack. The latitude is 45° 09.5' and the longitude is 112° 59.8'.

The AML project was about 18 miles in a straight line west-southwest of Dillon. To reach the site, proceed south on Interstate 15 from Dillon for about 4 miles. Leave the interstate at the Bannack State Park exit and proceed on paved State Highway 278 approximately 20 miles to the exit to the Park (well marked). Take the gravel road another mile to the Park. Right before reaching the Bannack Townsite take a right, proceed across the bridge over Grasshopper Creek past the campground until you reach the Mill building.

The Apex Mill is due south of the townsite of Bannack. The Mill is a short walk from either the townsite or the picnic grounds. The northern mill site boundary is 800 feet south of Grasshopper Creek on the south side of the Bannack bypass road.

For additional information on the location and access, the reader is referred to the Site and Vicinity Maps which follow this section.





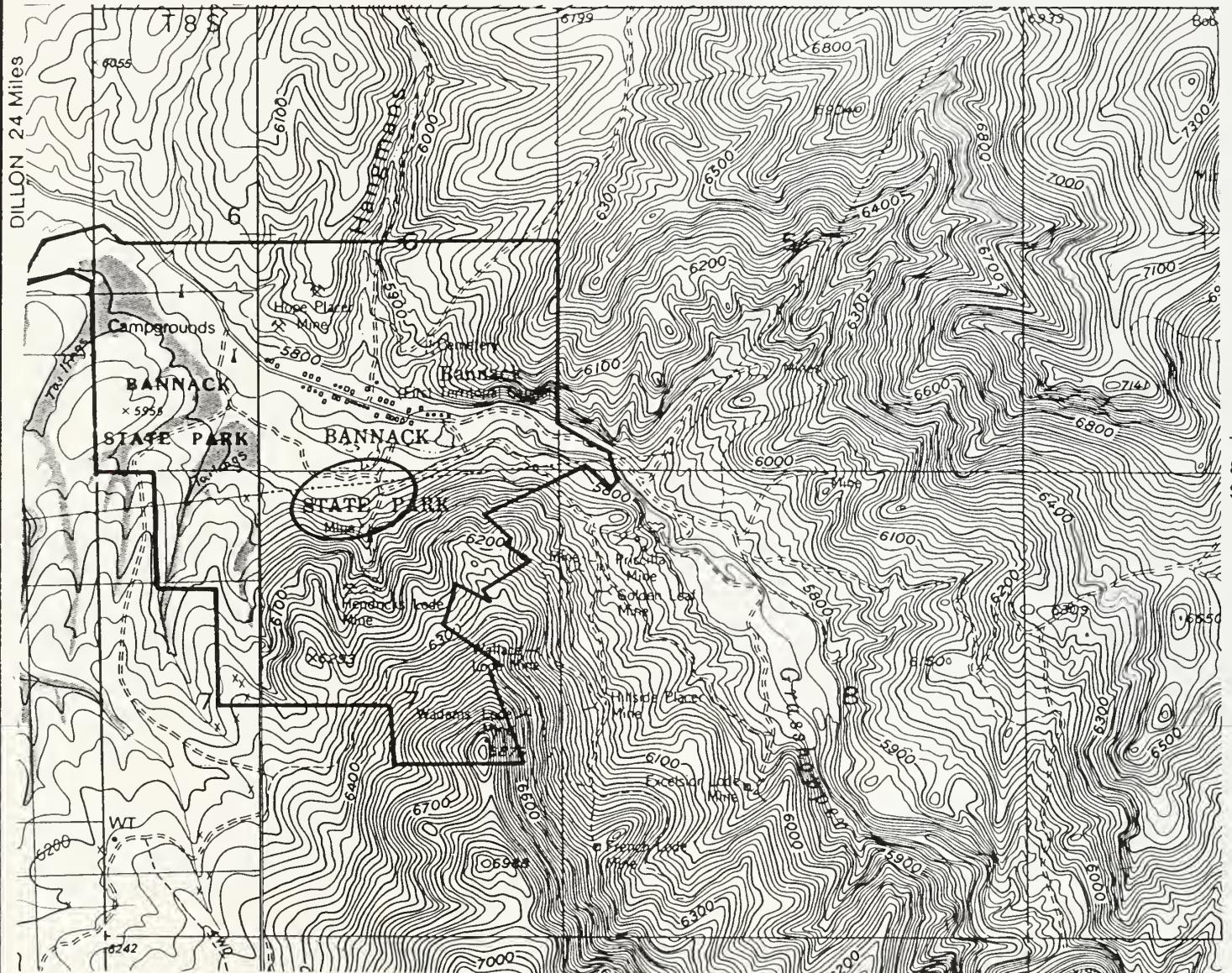
STATE OF MONTANA — DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU — RECLAMATION DIVISION

PA #01-006

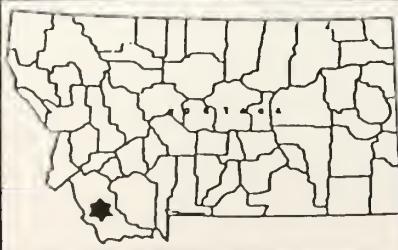
APEX MILL	VICINITY - MIAMI	COUNTY MI: TOWNSHIP	8S	RANGE 11W
BEAVERHEAD				

SECTION(S) _____ BLM MAP NAME: DILLON
MAP SCALE: 1"=2.5 Miles





R11W



STATE OF MONTANA — DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU—RECLAMATION DIVISION

LOCATION MAP

SITE APEX MILL

BEAVERHEAD

COUNTY, MT: TOWNSHIP

PA #01-006

BEAVERHEAD

SECTION(S) _____

MAP SCALE: 1" = 2000'

MAP SCALE: 1" = 2000' U.S.G.S. QUAD SHEET BANNACK



BANNACK STATE PARK PROJECT FINAL REPORT

1.1.2 Land Ownership

The landowner is the State of Montana. The Bannack State Park is managed by:

MT Department of Fish,
Wildlife and Parks
1400 South 19th
Bozeman, MT 59715
Telephone: 406/994-3552
Contact: Jerry Walker

On-Site Contact
Dale Tash
Bannack State Park
4200 Bannack Road
Bannack, MT 59725
Telephone: 406/834-3413

The AML project was located on the Hendricks Lode (MS 5407) and Hendricks Mill Site Claim. The mill and associated structures were purchased by the Department of Fish, Wildlife, and Parks on December 30, 1976. The recorded deed to both claims are in Book 211, Page 1284-1285 in the Beaverhead County Courthouse.

1.1.3 History

Detailed historical research and documentation exists for the entire Bannack area. Much of this is within the AMRB files as well as being available in libraries and at the Bannack State Park. The history is not repeated here. The mill was first operated by the Bannack Gold Mining Company in 1917. Minor stabilization work to preserve the mill was completed throughout the years between 1976 and 1991.

1.1.4 Physiography/Climatology

The mines surrounding Bannack are located on both sides of Grasshopper Creek, which flows southeastward through the district and into the Beaverhead River about 12 miles downstream.

Average precipitation near Bannack is shown to be about 12 inches on SCS maps, but is reported as less than 6 inches by local residents. Average precipitation increases to nearly 30 inches at the headwaters of Grasshopper Creek. Bannack appears to be in a precipitation shadow of the Continental Divide running along the top of the Bitterroot Range about 40 miles to the west. The climate is semi-arid and vegetation consists of sagebrush and grasses. There are coniferous trees, mostly on north-facing slopes. Riparian vegetation exists near the creek.

The elevation at Bannack is 5800 feet and the top of nearby hills is above 7000 feet. The stream valley is relatively narrow with steep terrain on both sides.



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1.1.5 Hydrology

In the Bannack area, the terrain is steep, the vegetation is relatively sparse, and the soils are mostly shallow. These factors combined typically cause any precipitation event to have a rapid and complete response with regards to surface water runoff. However, since the drainages in the mining district are small, the overall contribution to the flow in Grasshopper Creek is small.

Groundwater seems to occur only in the alluvium associated with the creek. All of the mine openings, except those in direct proximity with Grasshopper Creek are high and dry. There is no drainage from any of the openings, even those found in loosely cemented alluvial deposits.

1.2 Project Objectives

There are two project tasks addressed within the Bannack State Park Project.

Apex Mill Structure

The Apex Mill was unstable, unsafe, and deteriorating due to rot, decay and poorly constructed details and/or over stressed structural members. Over the years, attempts were made to reinforce, shore-up, and reconstruct many portions of the old mill. The majority of these efforts were short-term solutions and had little effect on the overall structural integrity of the structure.

The goal was to preserve and maintain the mill in its existing state by enhancing the structural integrity in a manner compatible with the historical significance of the building. The construction methods used to accomplish this task are described under Section 4.1 Description of Project Plan.

Apex Mill Tailings

Outside of the mill building to the northwest and northeast are tailing dumps covering over 3 acres. These tailings are estimated at 60,000 cubic yards in the upper or west pond and 19,000 cubic yards in the lower or eastern pond. The goal of reclamation will be to repair the tailings to a historically representative configuration as requested by the landowner (MT DFWP). The construction methods used to accomplish this task are described under Section 4.1 Description of Project Plan.



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2. RESPONSIBLE PARTIES

2.1 Contractor

The successful low bidder was L.R. Huckaba Ranch, Inc. Their address is shown below:

L.R. Huckaba Ranch, Inc.
26 Highway 359
Cardwell, Montana 59721
Phone: 406/287-3032
MT Contractor's License: 8025 A

2.2 Reclamation and Engineering Plan

Spectrum Engineering was assigned the responsibility of preparing the reclamation and engineering specifications prior to contractor selection. Wes Krivonen completed the structural engineering design under subcontract to Spectrum. Plans conforming to the general requirements were formulated in the field to meet specific conditions.

Spectrum's address is shown below:

Spectrum Engineering
3302 4th Avenue North
Billings, Montana 59101
Phone: 406/259-2412

2.3 Quality Control Inspection

Spectrum Engineering performed the quality control inspection. The project engineers were Don Sutton, Bill Maehl and Wes Krivonen. The construction inspectors were Bill Wolff and Tom McLeod.

2.4 AMRB Coordination

The AMRB Project Manager was Dale Herbort, Montana Department of State Lands, Abandoned Mine Reclamation Bureau.

BANNACK STATE PARK PROJECT FINAL REPORT

3. CHRONOLOGICAL LISTING OF EVENTS

3.1 Pre-Bid Conference

The pre-bid conference was held on August 12, 1991.

3.2 Bid Date

The bid opening date was August 23, 1991.

3.3 Three Lowest Bids

There were 8 bidders on this project with bids ranging from a low of \$ 77,475.00 to a high of \$ 213,326.00. The Engineer's Estimate was \$ 193,850.00. The three lowest bidders are listed below. A copy of the bid tabulations is included in the back under Attachment 1.

L.R. Huckaba Ranch Cardwell, Montana \$ 77,475.00	Coleman Construction Dillon, Montana \$ 129,000.00	G & G Housing Whitehall, Montana \$ 131,600.00
---	--	--

3.4 Contract Award

The contract was awarded to the low bidder after receiving all of his bonds and other required paper-work. L.R. Huckaba Ranch was the low bidder. The Contractor performed most of the work himself with some hired help.

3.5 Notice of Award

The Notice of Award was dated August 27, 1991 by the Department of State Lands and the Contractor acknowledged receipt of the Notice of Award on August 30, 1991.

3.6 Notice to Proceed

The Notice to Proceed was DSL dated September 17, 1991 and the Contractor acknowledged receipt of the Notice to Proceed on September 17, 1991.

3.7 Construction Start-up

The Contractor mobilized to the project and started work on September 23, 1991.



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3.8 Change Orders

There was one change order written for this project. A copy of this change order is included in this report under Attachment 2. The change order was written at the end of the project for final adjustment of the unit quantities used. The change order deducted a total of \$ 282.50 from the contract price.

3.9 Work Stoppages

There were no work shut-downs on this project.

3.10 Requests for Payment

There was one payment request on this project for the period from September 23, 1991 through October 30, 1991. The pay request for job completion was \$ 77,192.50. A copy of this payment request is found at the back in Attachment 3.

3.11 Substantial Completion

The date of Substantial Completion was October 30, 1991.

3.12 Final Completion and Approval

The Final Completion date is one year from the Substantial Completion date or October 30, 1992.

3.13 Final Payment

Final payment was made to the Contractor shortly after November 15, 1991 when the payment request received final approval from AMRB.



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4. CONSTRUCTION

4.1 Description of Project Plan

The goal of this project was to preserve and maintain the mill in its existing state. The goal was accomplished by enhancing the structural integrity in a manner compatible with the historical significance of the building. Materials used to preserve the building were identical to or consistent with those used in the original construction. Details such as joints, fasteners, structural methods were matched to those on-site. All metal brackets and braces added to the structure were date stamped. All wood added was date branded.

Every precaution was taken to prevent site damage to existing structural components and surrounding areas.

The purpose of this phase of the mill retrofit was to accomplish the following:

1. Laterally stabilize the facility reducing the potential of collapse. The design was for 75 mph wind with exposure "C" conditions and assuming the plyboard diaphragm that was added several years ago will assume design diaphragm loads. An interior frame was added to reduce stress on the roof diaphragm. Residual snow loadings were not included in the analysis because of seasonal usage, therefore wind was the governing design criterion.
2. Repair, replace or reinforce existing framing members and deficient connections which should theoretically add years to the structure and produce a safe environment for tourists. The structural members were designed to support a 20 psf snow load plus drifting. Drifting was included in the design as an attempt to more closely depict actual loading conditions and thereby reduce the potential of collapse during the winter months.
3. To increase the usable life of the structure and its contents. By placing concrete footings beneath the load bearing columns and properly attaching them to the roofing, the potential for further deterioration due to decay was reduced and the potential for settlement was greatly reduced. Many of the wind girts were either broken or no longer attached to supporting elements.
4. To reduce the potential of collapse and liabilities incurred due to decay. Rotten timbers supporting Tank #3 were replaced and the tank leveled. Rotten framing supporting the maintenance facility were replaced.

Outside of the mill building are tailing dumps covering over 3 acres. The goal of reclamation was to repair the tailings to a historically representative configuration. This work entailed reconstructing containment berms along several tailings ponds and



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disposing of materials which had been dumped on top of the tailings in recent years. This material was buried in the tailings area during the recontouring process. In addition, areas which had been damaged by erosive piping was repaired and a drainage course was graded to carry runoff between the two major sections of the tailings area.

The sagebrush destroyed during the regrading was removed and disposed of. New sagebrush (Basin Big variety) was planted in the areas where sagebrush was before the regrading. A total of 125 containerized sagebrush approximately 6 inches in height was planted and watered several times.

The Hendricks adit is located approximately 200 feet south of the mill structure about 50 feet higher in elevation. The adit is directly to the west of the small gully draining the basin above the mill. Access is currently controlled to the adit with a gate. No action was planned for this adit at this time. The other mine openings on the State Park had engineering closures designed and costed. These were subsequently dropped from this bid package. The Department of Fish, Wildlife and Parks (landowner) is in the process of evaluating their master plan for the Park. The other openings will have to be considered as part of this process.

4.2 Major Equipment List

Type	Make/Model	Size/Horsepower	No. on Job
Backhoe-loader	Case 580	3/4 yd - 40 hp	1
Air Compressor	Ingersoll Rand		1
Fuel Tank	Diesel		1
Water Tank	Water	300 gallon	1
Track Dozer	Cat D-7		1
Tractor	Case 275 4x4		1

4.3 Contractor Employees

The number of contractor employees on the job was never more than 4 counting the Contractor himself.

4.4 Construction Activities

A chronological summary of construction activities follows. The Bannack State Park Project started with mobilization on September 23, 1991. They started immediately on the tailings area and started to dig out around the mill for the new footings. The tailings ponds were completed within a matter of days and given final sign-off by the engineer and AMRB on 10-14-91. Due to the historical sensitivity of the project, the AMRB project manager visited the site weekly to monitor the work. The work on the Mill progressed steadily forward throughout the entire job in a logical fashion until completion.



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4.5 Quantities Used

ITEMIZATION OF QUANTITIES AND COSTS

<u>Item</u>	<u>Amount</u>	<u>Unit</u>	<u>Unit Cost</u>
Mobilization	1	Lump Sum	\$5,000. / unit
Provide Water	14.5	Kgal	\$65. / Kgal
Tailings Pile Regrading	1	Lump Sum	\$30,000. / unit
Apex Mill Stabilization	1	Lump Sum	\$40,000. / unit
Plant Containerized Sagebrush	125	Each	\$10. / each
Transport Sagebrush Plugs	0	Each	\$25. / each

5. PAYMENT REQUESTS

5.1 Pay Request

One payment request was processed for this project. A copy of the payment request has been included in Attachment 3.

5.2 Cost per Site

<u>Site Name</u>	<u>Disturbed Acres</u>	<u>Cost/Acre</u>	<u>Total Project Cost</u>
Bannack State Park	3.00	\$ 25,730.83	\$ 77,192.50

The cost per acre on this project is virtually meaningless. The 3 acres of tailings which were regraded were not revegetated. Sagebrush was the only thing planted. The majority of the cost was in the reconstruction of the mill building.

5.3 Total Project Cost

The original bid was \$ 77,475.00 and one change order was issued for -\$282.50 bringing the total construction cost to \$77,192.50. The design engineering cost for the Bannack State Park project was \$ 72,916.82. This number included several more sites than what went to construction. An analysis of the engineering costs versus construction costs is presented in Attachment 4.



BANNACK STATE PARK PROJECT FINAL REPORT

6. PROJECT SUMMARY

6.1 Summary of Project

Reclamation of the Bannack State Park Project was performed in accordance with the bid package. The project was started with mobilization on September 23, 1991. The project finished on October 30, 1991 and the final inspection was made on November 5th, 1991 with the Department of Fish, Wildlife and Parks; State Historical Preservation Office; AMRB; and Spectrum in attendance. The Contractor used 38 calendar days of the 60 day contract.

The project was completed in a timely fashion. The Contractor did a lot of little extras within his contract including clearing the debris away from the side of the Mill, completely rebuilding the stairways, and adding additional posts and metal brackets. The Contractor was easy to work with and open to suggestions.

6.2 Site Condition after Completion

The tailings were smooth graded and watered to give them a historical, natural appearance. The mill building reconstruction was completed and within several years the newer wood should weather some and look more natural.

6.3 Maintenance or Follow-up

The sagebrush plants should be checked next spring to determine reclamation success. Since sagebrush grows naturally in the whole region, it shouldn't be necessary to replant. The 11-month warranty check should also be made in late August, September or early October of 1992.

6.4 Bid Package (Construction) Drawings

The bid package contained twenty Site Plan sheets (labeled 1 through 3 and S1 through S17). The first three showed the project location and the work required on the tailings, the next nine Site Plans covered the work on the Mill. The last 8 were photo sheets of the exterior of the Mill building. The Site Plans are located in Attachment 5 at the back of the final report. These plans represent the reclamation engineering design (the plans from which the contractors bid the work).

6.5 As-Built Drawings

A set of the bid package construction drawings referenced under Section 6.4 were taken and modified to reflect the as-built final reclamation construction. These are located in Attachment 6 right before the photographs and directly behind the bid package construction Site Plans located in Attachment 5.



BANNACK STATE PARK PROJECT FINAL REPORT

7. COMMENTS/SUGGESTIONS

The Contractor did a good job on the tailings ponds and the construction activity on the Mill building. All parties involved seemed satisfied with the work completed.

Past work had been completed around the Mill building and on the Tailings Ponds by the Montana Department of Health and Environmental Sciences (DHES) in recent years. Some of this work was unacceptable to the Park personnel and was redone during this construction. This included covering the unsuitable material dumped on top of the tailings ponds. One item noted during construction was that wherever DHES had used sand and gravel next to the wood on the building that the wood rot was far worse than the wood that was in contact with the natural ground.

After several meetings between the AMRB, engineer, and the Department of Fish, Wildlife and Parks (DFWP the landowner), we proceeded with engineering design on several additional sites within the State Park including mine openings, a portal rehabilitation, and redesign of a diversion ditch. After completing the design, preparing the OSM narrative and the draft bid package, the DFWP felt these additional sites would need to be placed on hold until they were reevaluated and considered as part of the 10 year master development plan for the Park. This added significantly to the overall engineering costs as noted below.

The Contractor told AMRB that he "bought" the job. Therefore, trying to use the bid number for future comparisons becomes meaningless. The elderly Huckaba wanted his grandson to get a good start in the construction business and bid this job at a presumed loss. He indicated that he wanted his grandson to have a good State job to his credit. The next closest two bids were \$51,525 and \$54,125 higher at \$129,000 and \$131,600 respectively.

The above discussion highlights some of the problems shown with the Analysis of Costs shown in Attachment 4. The engineering costs appear high in relation to construction. This is attributable to several different factors. The additional design and engineering costs were as follows: diversion ditch at \$1,578, other openings at \$7,657, water wells at \$7,953, and as-is drawings of the Mill to satisfy the historical groups at \$9,427. This amounted to \$26,615 of the total design cost of \$69,409. Had this work not been requested or had DFWP allowed construction on these other sites the percentages would have been more in line with expected results. The design and construction engineering cost for the Mill and the tailings pond alone is \$64,045. The true construction cost should have been \$129,000 (2nd place bid). This would have yielded a ratio of 50% for total engineering versus construction.



BANNACK STATE PARK PROJECT FINAL REPORT

8. PHOTOGRAPHS/SLIDES

8.1 Photo/Slide Description Listing

The description of the slides and photographs taken to document the work performed is located at the back of the final report under Attachment 7. Picture numbers 1 through 6 show the equipment used to execute the work. Numbers 7 through 45 show the tailings pond area and associated reclamation work. Numbers 46 through 156 show the Apex Mill building before, during and after construction.

Each picture is numbered on the front and has a generic label on the back. Following the photo descriptions are the photo location maps and then the photos or slides themselves. The two original bound final reports contain photographs and the unbound original report contains the slides. The three additional copies requested contain photocopies of the photographs.

8.2 Photo Index Maps

The location where the photos were taken and their orientation are shown on the plan sheets located in Attachment 7 at the back of the report.

8.3 Photos/Slides

A sequence of photographs documenting the construction activities begins immediately following the photo location maps found in Attachment 7 at the back of the report.



ATTACHMENT 1

BID TABULATIONS

BANNACK STATE PARK PROJECT
BEAVERHEAD COUNTY, MONTANA

DSL/AMRB 91-006
DATE AUGUST 23, 1991

BID TABULATIONS				ENGINEER'S ESTIMATE	G & G HOUSING	WESTERN STATES CONTRACTING, INC.	L. R. HUCKABA RANCH, INC.
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price		
1.	1	LS	MOBILIZATION	22,000.00	22,000.00	20,000.00	25,000.00
2.	15.0	KGAL	PROVIDE WATER	30.00	450.00	60.00	900.00
3.	1	LS	TAILINGS POLE REGRADING	11,600.00	11,600.00	30,000.00	24,787.00
4.	1	LS	APEX MILL STABILIZATION	156,300.00	156,300.00	80,000.00	98,089.06
5.	100	EA	PLANT CONTAINERIZED SAGEBRUSH	15.00	1,500.00	5.00	500.00
6.	20	EA	TRANSPLANT SAGEBRUSH PLUGS	100.00	2,000.00	10.00	200.00
ADJUSTED TOTAL FOR BANNACK STATE PARK PROJECT				193,850.00		131,600.00	156,458.01
ORIGINAL BID PRICE				193,850.00		131,600.00	156,458.01
							77,475.00

BANNACK STATE PARK PROJECT
BEAVERHEAD COUNTY, MONTANA

DSLJAMRB 91-006
DATE AUGUST 23, 1991

BID TABULATIONS				JOHNSON CONSTRUCTION	SHARBONO CONSTRUCTION, INC.	A. M. WELLES, INC.	HALLETT RECLAMATION CO.
Item Number	Estimated Quantity	Unit	Description				
1.	1	LS	MOBILIZATION	10,000.00	2,500.00	6,000.00	4,820.00
2.	15.0	KGAL	PROVIDE WATER	50.00	.10	* 1.50	125.00
3.	1	LS	TAILINGS PILE REGRADING	50,000.00	9,990.00	7,200.00	11,465.00
4.	1	LS	APEX MILL STABILIZATION	103,500.00	125,520.00	124,930.00	195,684.00
5.	100	EA	PLANT CONTAINERIZED SAGEBRUSH	26.00	2,600.00	2.00	200.00
6.	20	EA	TRANSPLANT SAGEBRUSH PLUGS	30.00	600.00	15.00	300.00
ORIGINAL TOTAL FOR BANNACK STATE PARK PROJECT				167,450.00	140,811.50	140,305.00	213,326.30
ORIGINAL BID PRICE				167,450.00	142,310.00	140,305.00	213,326.00

BANNACK STATE PARK PROJECT
BEAVERHEAD COUNTY, MONTANA

DSL/AMRB 91-006
DATE AUGUST 23, 1991

BID TABULATIONS				COLEMAN CONSTRUCTION, INC.
Item Number	Estimated Quantity	Unit	Description	
1.	1	LS	MOBILIZATION	6,500.00
2.	15.0	KGAL	PROVIDE WATER	100.00
3.	1	LS	TAILINGS PILE REGRADING	16,000.00
4.	1	LS	APEX MILL STABILIZATION	100,000.00
5.	100	EA	PLANT CONTAINERIZED SAGEBRUSH	40.00
6.	20	EA	TRANSPLANT SAGEBRUSH PLUGS	50.00
TOTAL FOR BANNACK STATE PARK PROJECT				129,000.00
ORIGINAL BID PRICE				129,000.00
G:\RECLAM\AMRB\SP-BANNACK.BID				0.00

ATTACHMENT 2

CHANGE ORDERS

CHANGE ORDER

ORDER NO. 1

PROJECT TITLE: Bannack State Park

MONT A/E or DSL-AMRB: 91-006

CONTRACT DATE: 9/23/1991

OWNER: Montana Department of State Lands, Abandoned Mine Reclamation Bureau

CONTRACTOR: L.R. Huckaba Ranch, Inc.

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'L'S.	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
2	Provide water: -0.5 kgal					65.00	-32.50
5	Plant containerized sagebrush +25 units					10.00	250.00
6	Transplant sagebrush plugs -20 units					25.00	-500.00
TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC.							-282.50
OVERHEAD & PROFIT @ _____ %							
GRAND TOTAL - THIS CHANGE ORDER							-282.50

Original Contract Price	<u>77,475.00</u>
Current Contract Price Adjusted by Previous Change Order	<u></u>
Cost this Change Order (+ or -)	<u>-282.50</u>
New Contract Price including this Change Order	<u>77,192.50</u>

The completion date as set forth in the Contract Documents shall be (unchanged, increased, decreased) by 0 calendar days.

The date for completion of all work will be 11/21/1991.

Description and Justification for Change:

1. Slightly less water was used than anticipated.
2. Decision was made to plant more containerized sagebrush and not to transplant existing sagebrush.
3. Stairs were replaced to meet todays codes at no additional cost.
4. Reconfigured framing to allow tank #2 to extend above floor level, floor was leveled and provided new planking was used as required to replace unsalvageable existing planking at no additional cost.
5. Modified existing beam splice (detail 3/S5) need only be installed at load bearing locations at west wall and intermediate beam per section 2/S5 at no additional cost.
6. Contractor to provide 16ga x 1 1/2" x 1-2" straps with 6-16d each side of notch. Strap is required at new girt only when girt spans are 14'+. No additional cost.
7. Contractor is to install truss bracing, new post and new footing per section 6/S5 requirements at no additional cost.

SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by \$_____ (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by \$_____ (100% of the Change Order amount).

COUNTERSIGNED BY MONTANA
RESIDENT AGENT

SURETY

By: _____

Seal

Recommended by: _____

William C Mack SPECTRUM 11/6/91

Engineer

Date

Accepted by: _____

Kipp R. Hulda

11-6-91

Date

Approved by: _____

Edward P. Senash

Owner

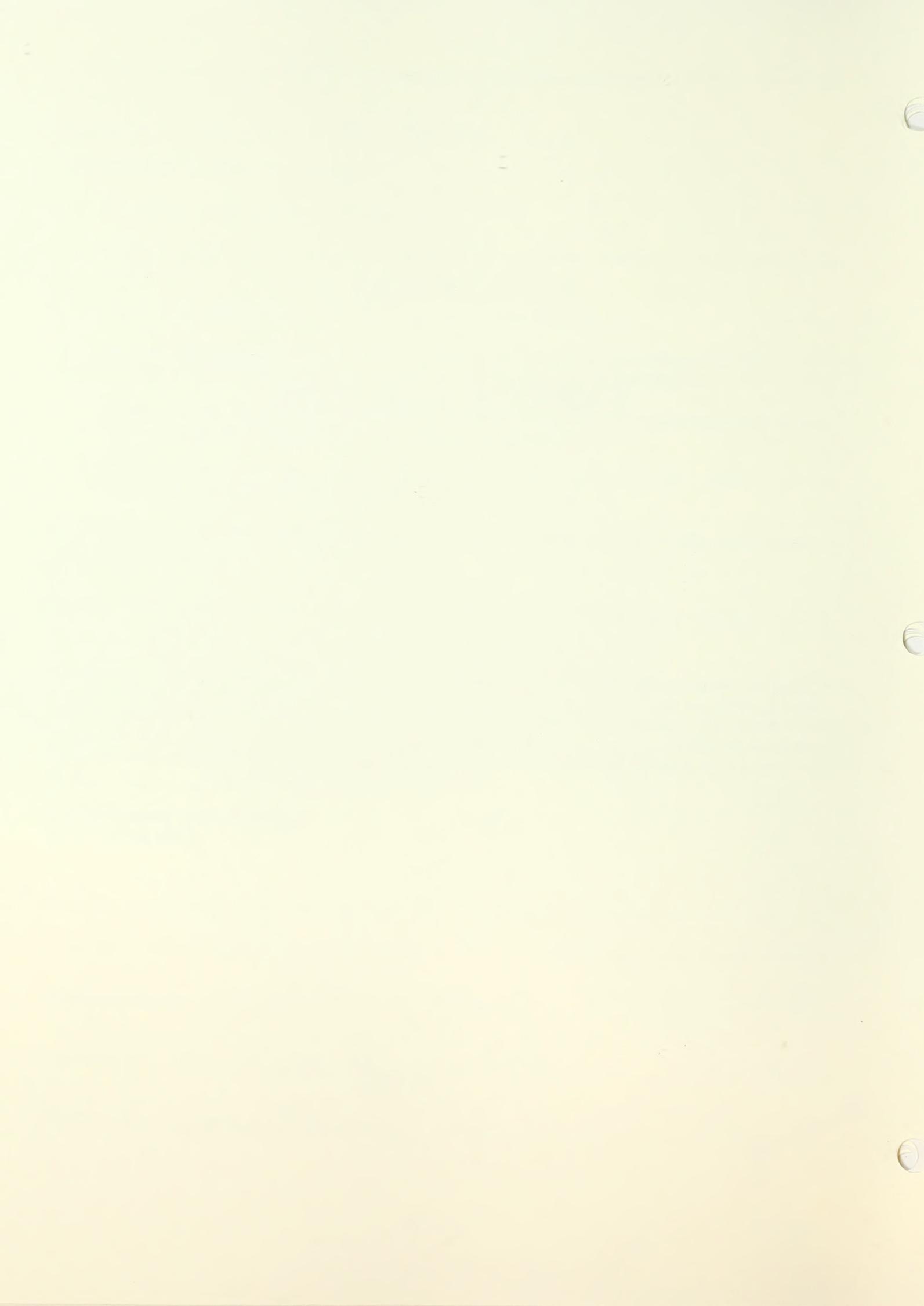
Nov. 15, 1991

Date

DH

ATTACHMENT 3

PAYMENT REQUESTS



PAYMENT REQUEST NO. 1 (FINAL)

FROM 9/23/1991 TO 10/30/1991

PROJECT TITLE: BANNACK STATE PARK

LOCATION: Beaverhead County, Montana MONT A/E or DSL-AMRB: 91-006

NAME OF CONTRACTOR: L.R. Huckaba Ranch, Inc.

ADDRESS: 26 Highway 359, Cardwell, Montana 59721

SUMMARY OF PROJECT STATUS

Amount of Original Contract \$ 77,475.00

Change Order No. 1 \$ - 282.50
Change Order No. _____ \$ _____
Change Order No. _____ \$ _____

Amount of Approved Change Order(s) \$ -282.50

TOTAL CONTRACT AMOUNT \$ 77,192.50

Pay Request No.	Amount of Request
1 (Final)	\$77,192.50

Total Contract Amount Completed to Date \$ 77,192.50

Less Retainage (0.00 %) \$ 0.00

TOTAL AMOUNT EARNED TO DATE \$ 77,192.50

Less Previous Payments \$ 0.00

AMOUNT DUE THIS PAYMENT \$ 77,192.50

Less 1% Tax \$ 771.92

TOTAL DUE CONTRACTOR \$ 76,420.58

I certify that this claim is correct and just in all respects and
that payment or credit has not been received.

APPROVED BY:

By Kerry R. Huckaba
L.R. HUCKABA RANCH, INC.
Contractor
Date 11-6-91

Dept. of State Lands, Abandoned Mine Reclamation Bureau
Owner

By Edward L. Sander
Date Nov. 15/91

DN

RECOMMENDED BY:

SPECTRUM ENGINEERING
Engineer
By William C. Mack
Date 11/6/91

Item No.	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed To Date	Total Contract Amount Completed To Date	Amount Due this Payment
1	Mobilization	1 L.S.	\$22,000.00 5000.00	0	1	1	\$ 5,000.00	\$ 5,000.00
2	Provide Water	14.5 KGAL	\$ 942.50	0	14.5	14.5	\$ 942.50	\$ 942.50
3	Tailings Pile Regrading	1 L.S.	\$30,000.00	0	1	1	\$30,000.00	\$30,000.00
4	Apex Mill Stabilization	1 L.S.	\$40,000.00	0	1	1	\$40,000.00	\$40,000.00
5	Plant Containerized Sagebrush	100 EACH	\$ 10.00	0	125	125	\$ 1,250.00	\$ 1,250.00
6	Transport Sagebrush Plugs	20 EACH	\$ 25.00	0	0	0	\$ 0.00	\$ 0.00
TOTAL							\$77,192.50	\$77,192.50

ATTACHMENT 4

ANALYSIS OF CONSULTANT COSTS INCURRED



BANNACK STATE PARK PROJECT FINAL REPORT

ANALYSIS OF CONSULTANT COSTS INCURRED
FOR THE MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU
AMR PROJECT NUMBER: DSL-AMRB 91-006
BANNACK STATE PARK PROJECT

DATE OF PREPARATION: JANUARY 27TH, 1992

ENGINEERING SERVICE	AMOUNT
DESIGN ENGINEERING:	
JULY 1990-JUNE 1991 CONTRACT	\$50,980.43
1990-91 CONTRACT EXTENSION FOR 1991-92	\$ 1,492.75
OUTSIDE CONTRACT SERVICES	<u>\$16,935.36</u>
SUBTOTAL DESIGN ENGINEERING COST:	<u>\$69,408.54</u>
CONSTRUCTION ENGINEERING AND PROJECT ADMINISTRATION COST:	
1990-91 CONTRACT EXTENSION FOR 1991-92	<u>\$21,357.01</u>
SUBTOTAL CONSTRUCTION ENGINEERING COST:	<u>\$21,357.01</u>
PROJECT ENGINEERING COST:	<u>\$90,765.55</u>
CONSTRUCTION COST:	<u>\$77,192.50</u>
PERCENTAGE ENGINEERING FEES TO CONSTRUCTION COST:	
DESIGN ENGINEERING/CONSTRUCTION COST	89.9%
CONSTRUCTION ENGINEERING/CONSTRUCTION COST	27.7%
TOTAL ENGINEERING COST/CONSTRUCTION COST	117.6%

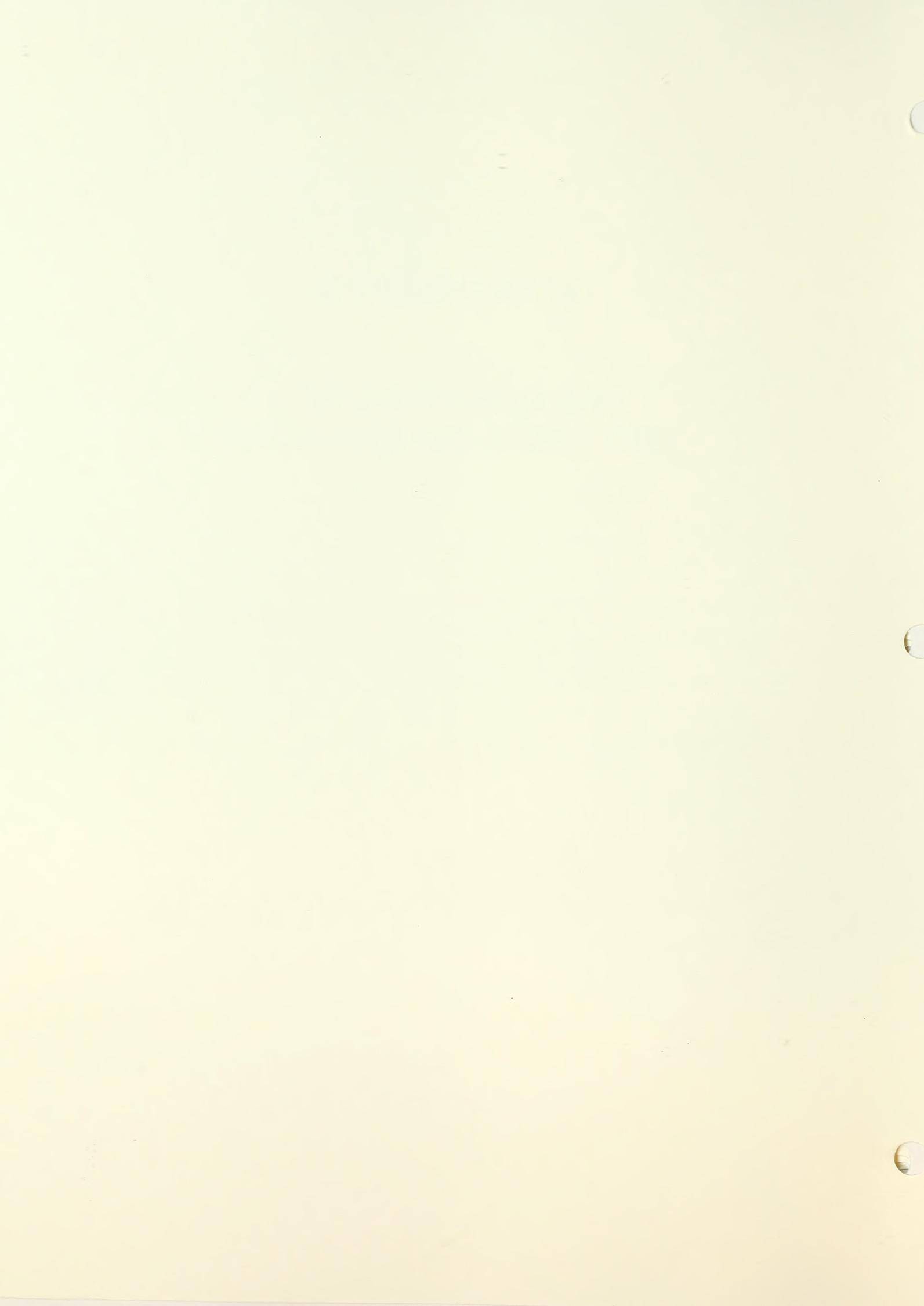
REMARKS: Services provided included landowner contact and consent, budget preparation, basic engineering and reclamation design, structural design of the Mill, cultural resource consideration, NCP plans, water well drilling and water sampling, bid document preparation, construction staking, contract administration, quantity accounting, full time construction/reclamation inspection and final report preparation and project close-out.

NOTE: See the Engineering versus Construction cost discussion presented under Section 7 of this report.



ATTACHMENT 5

PRE-CONSTRUCTION (BID PACKAGE) DRAWINGS



BANNACK STATE PARK PROJECT

LOCATED IN
BEAVERHEAD COUNTY, MONTANA

DSL/AMRB 91-006

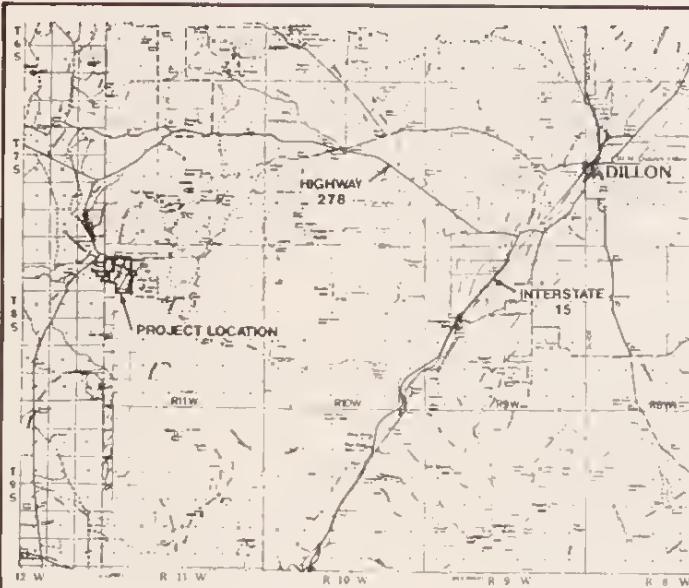
PREPARED FOR

MONTANA DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU

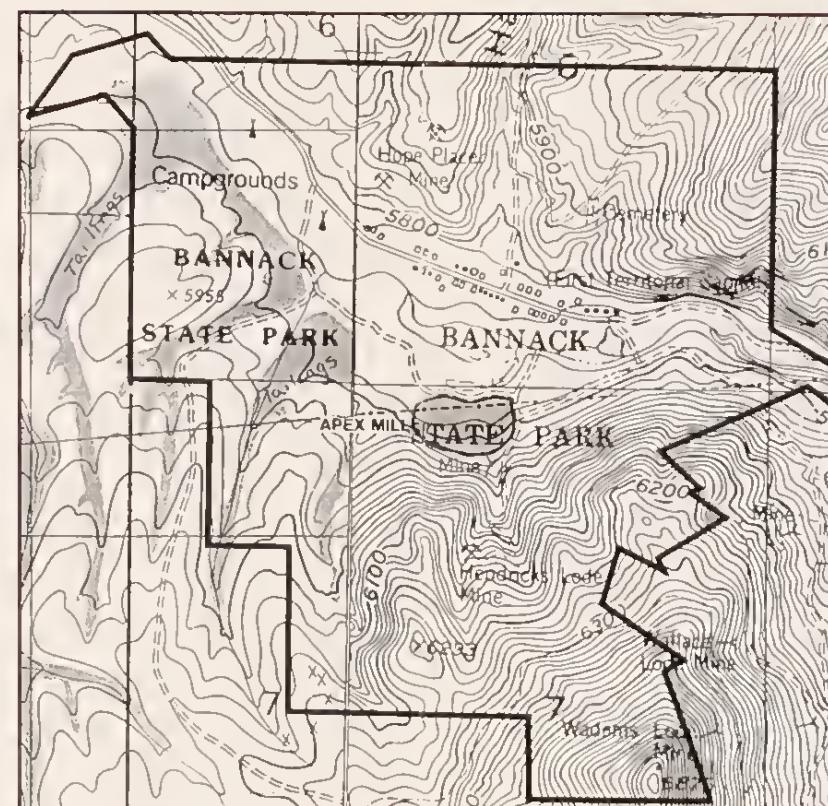
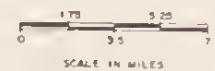


STATE LOCATION MAP

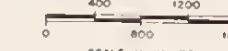
N



AREA MAP



BANNACK STATE PARK



INDEX

DESCRIPTION

SHEET NO.

COVER SHEET 1
APEX MILL 2-3

FOUNDATION PLAN S-1
INTERMEDIATE LEVEL FRAMING PLAN S-2
ROOF FRAMING PLAN S-3
OVERALL SECTIONS & DETAILS (LOWER ROOFS) S-4
OVERALL SECTIONS & DETAILS (UPPER ROOFS) S-5
BRACING ELEVATION & DETAILS (INTERMEDIATE FRAME) S-6
BRACING ELEVATION & DETAILS (NORTH & SOUTH FRAME) S-7
BRACING ELEVATION & DETAILS (EAST & WEST FRAME) S-8
DETAIL SHEET S-9
PHOTO PLANS FOR EXISTING STRUCTURES S-10 to S-17

LANDOWNER AND CONTACT

MONTANA DEPARTMENT OF FISH, WILDLIFE & PARKS

c/o Jerry Walker
1400 South 19th
Bozeman, Mt. 59715
Phone: 406-994-3552

c/o Dale Tash
Bannack State Park
4200 Bannack Road
Bannack, Mt. 59725
Phone: 406-834-3413

REDUCED PRINTS APPROX. 1/2 ORIGINAL SCALE

PREPARED BY:

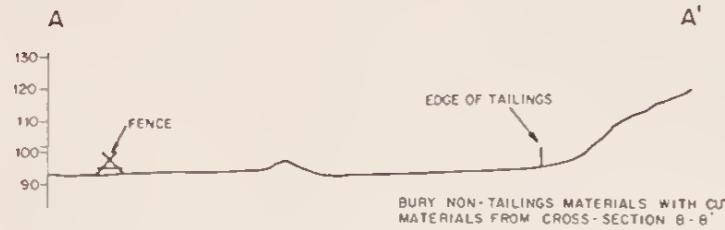
SPECTRUM ENGINEERING
Mining and Civil Engineers

3302 4th AVE. NORTH
BILLINGS, MONTANA



GRADING PLAN OBJECTIVES

1. SLOPE ALL TAILINGS SO THEY DRAIN TOWARDS THE CENTER OR TOWARDS THE HILL, AWAY FROM THE OUTSIDE
2. SURROUND THE TAILINGS LEVELS WITH AT LEAST 2' HIGH BERMS $2\frac{1}{2}$ ft 1v SLOPES
3. COVER ANYTHING THAT IS NOT TAILINGS WITH TAILINGS
4. WHEN COMPLETED, THE TAILINGS MUST APPEAR NATURAL WITH NO TIRE OR TRACK MARKS



WORK SUMMARY TABLE

ITEM	DESCRIPTION	ACTION	ESTIMATED QUANTITY
BERM CONSTRUCTION	LOWER TAILINGS BERM SEDIMENT POND BERM NE POND TAILINGS BERM	CONSTRUCT BY REGRADING CONSTRUCT BY REGRADING CONSTRUCT BY REGRADING	185 CU YDS 37 CU YDS 89 CU YDS <u>311 CU YDS</u>
BURYING UNSUITABLE MATERIAL UNDER THE TAILINGS	MATERIAL FROM MILL VATS MATERIAL FROM TAILINGS SPILL ON TOP OF NE POND	GRADE AND COVER	444 CU YDS
		1 EXCAVATE UNSUITABLE AND STOCKPILE. 2 SUB-EXCAVATE SUITABLE AND STOCKPILE 3 BURY UNSUITABLE IN SUB-EXCAVATED HOLE. 4 COVER ALL UNSUITABLE MATERIAL WITH THE STOCKPILED SUITABLE MATERIAL.	150 CU YDS 400 CU YDS 300 CU YDS <u>400 CU YDS</u> <u>1894 CU YDS</u>
WATER PIPING	EROSION FROM PIPING	EXCAVATE PIPING AREA REPLACE AND COMPACT	275 CU YDS 275 CU YDS
TAILINGS GRADING	NORTH-CENTRAL POND SWALE FROM HILLSIDE TO SEDIMENT POND GOING PAST THE MILL	CUT AND FILL GRADE A SHALLOW SWALE	110 CU YDS 230 CU YDS
REVEGETATION	SAGEBRUSH	PLANT CONTAINERIZED STOCK (6'-1' HIGH) TRANSPLANT SAGEBRUSH (NOT OVER 2 FEET HIGH)	100 UNITS 20 UNITS
WATER	TAILINGS AND PIPING SAGEBRUSH WATERING ROADS AND OTHER AREAS	DUST SUPPRESSION AND COMPACTION WATER AFTER PLANTING DUST SUPPRESSION	4.2 KGALS 0.3 KGALS <u>10.0 KGALS</u> <u>15.0 KGALS</u>

WORK DESCRIPTION

- RECONSTRUCT CONTAINMENT BERMS ALONG SEVERAL TAILING PONDS
- DISPOSE OF MATERIALS DUMPED ON TOP OF THE TAILINGS BY BURYING DURING THE TAILINGS REGRADING.
- REPAIR AN AREA DAMAGED BY WATER PIPING BY EXCAVATING AND RECOMPACTING THE DAMAGE AREA.
- REGRADE THE MILL TAILINGS SO THAT WATER LANDING ON OR RUNNING OVER THE TAILINGS DRAINS AWAY FROM GRASSHOPPER CREEK. DISPOSE OF SAGEBRUSH DAMAGED DURING REGRADING
- PLANT CONTAINERIZED STOCK OF BASIN BIG SAGEBRUSH AND TRANSPLANT SAGEBRUSH PLUGS ON ALL AREAS WHERE SAGEBRUSH WAS DISTURBED DURING REGRADING. EIGHTY (80) PERCENT OR GREATER OF THE ROOTS MUST BE DUG UP WITH THE TRANSPLANTS. WATER ALL PLANTED SAGEBRUSH IMMEDIATELY AFTER PLANTING AND WATER ONCE MORE PRIOR TO DEMOBILIZING FROM THE JOB SITE. WHEN PLANTING THE SAGEBRUSH SPREAD THE ROOT SYSTEM AND POINT THE ROOTS DOWN
- PROVIDE WATER AS NECESSARY FOR DUST SUPPRESSION AND COMPACTION AND FOR WATERING THE NEWLY PLANTED SAGEBRUSH
- APEX MILL STABILIZATION (COVERED ON A DIFFERENT SITE PLAN SHEET)

SITE PLAN AND GENERAL LAYOUT

APEX MILL
SECTION 7, T8S, R1W
BEAVERHEAD COUNTY, MONTANA

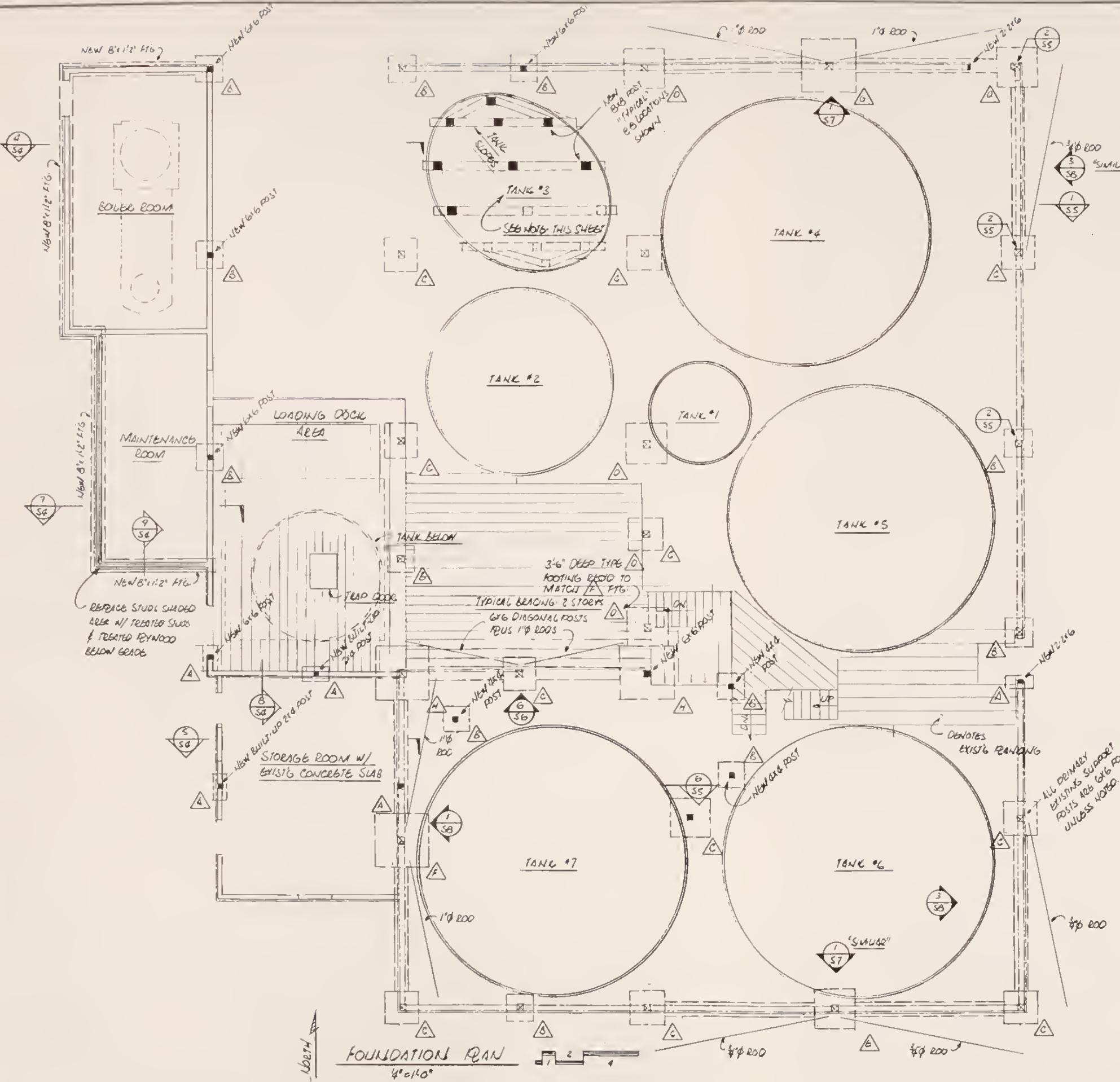
STATE OF MONTANA
DEPARTMENT OF STATE LANDS

DATE	MARCH 1991
GRADE BY	OLD
APPROVED BY	BM
NO.	1
REVISONS	0
SHEET NO.	3

SPECTRUM ENGINEERING
Mining and Civil Engineers

3302 4th Ave North
BILLINGS, MONTANA





TANK #3 - EXISTING POST & BRACING REPLACEMENT PROCEDURE

- 1.) JACK & SHORE TANK AS REQUIRED FOR REMOVAL OF EXISTING POSTS.
- 2.) REMOVE EXISTING ROTTED TIMBER POSTS & BRACING.
- 3.) INSERT NEW PRESSURE TREATED 8x8 POSTS ± 4' LONG AT 8 SHADeD LOCATIONS NOTED.
- 4.) POSTS ARE TO BEAR DIRECTLY ON THE EXISTING SUBSURFACE CONCRETE SLAB AT LOCATIONS OF EXISTING POSTS.
- 5.) REMOVE JACKS & SHORing.
- 6.) PROVIDE 2x6 DIAGONAL BRACE AT EACH NEW POST LOCATION POSITIONED SIMILAR TO EXISTING. (ESTIMATE 4 BRACES ± 10' LONG)
- 7.) TIGHTEN STEEL BANDS ON REWOOD TANKS

FOOTING SCHEDULE		
MARK	SIZE	REINFORCEMENT
A	1/2" x 2'0" x 1'0"	NONE REQ'D
B	2'0" x 2'0" x 1'0"	NONE REQ'D
C	2'6" x 2'6" x 1'0"	NONE REQ'D
D	3'0" x 3'0" x 1'0"	3- #6 EA WAY
E	3'0" x 3'0" x 2'0"	NONE REQ'D
F	4'0" x 4'0" x 2'0"	NONE REQ'D
G	4'0" x 6'0" x 3'0"	NONE REQ'D
H	4'0" x 6'0" x 3'6"	NONE REQ'D

DIMENSIONAL NOTES:

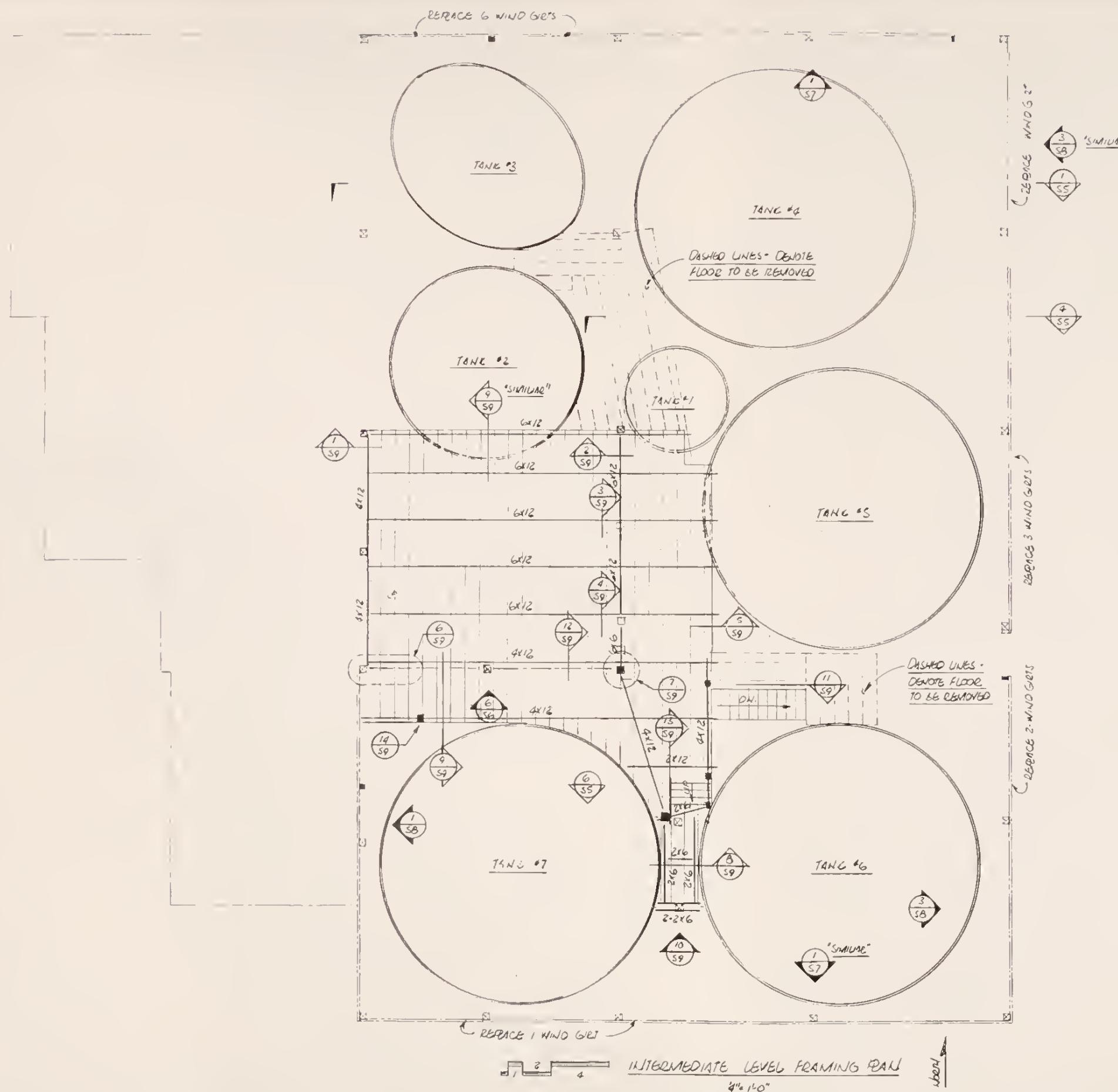
SCALE PLANS, SECTIONS, & DETAILS FOR QUANTITY TAKEOFFS.
ALL SCALED DRAWINGS TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION

SITE PLAN AND GENERAL LAYOUT

APEX MILL FOUNDATION PLAN

STATE OF MONTANA	
DEPARTMENT OF STATE LANDS	
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION	
DATE	03/01/1991
DRAWN BY	
APPROVED BY	
REVISIONS	
NO.	
REVISED DATE	
BY	
1 5/20/91 JK	
BILLINGS, MONTANA	
SHEET NO. S1	





UPPER LEVEL FRAMING REPLACEMENT PROCEDURE

- 1.) REMOVE ALL EXISTING RANKING - NUMBER AND STOCKPILE FOR RE-USE.
 - 2.) REMOVE EXISTING SUPERSTRUCTURE AS REQUIRED - BEAMS, COLUMNS, STAIRS, ETC. THAT ARE SUPPORTING FLOOR ONLY AND STOCKPILE AS REQUIRED FOR LATER USE.
 - 3.) LOCATE NEW SUPPORT COLUMNS AT LOCATIONS SHOWN ON THE DRAWINGS. POUR FOOTINGS AT NEW POST LOCATIONS UTILIZING MODIFIED DETAIL 6/5.4 AT 4x4 POST LOCATIONS.
 - 4.) ERECT NEW SUPERSTRUCTURE PER DETAIL REQUIREMENTS. USE #1 GRADE LOGS/POLES AND #2 OR BETTER DRYED SAWN TIMBERS (RELATIVELY CLEAR OF KNOTS & CHECKS) FOR BEAMS, JOISTS, AND COLUMNS.
 - 5.) INSTALL HANDRAILS AND STANDARDS USING PRANGE 10X10 DRYED DOUGLAS HR #2 OR BETTER.
 - 6.) INSTALL STOCKPILED 2X RANKING W/ 2x4D POLE BARN NAILS AT EACH SUPPORT. WHERE ORIGINAL RANKING IS NOT SUITABLE, RESPACE WITH ANOTHER ORIGINAL RANKING.
 - 7.) MODIFY CONSTRUCT AND INSTALL STAIRS PER DETAIL REQUIREMENTS.

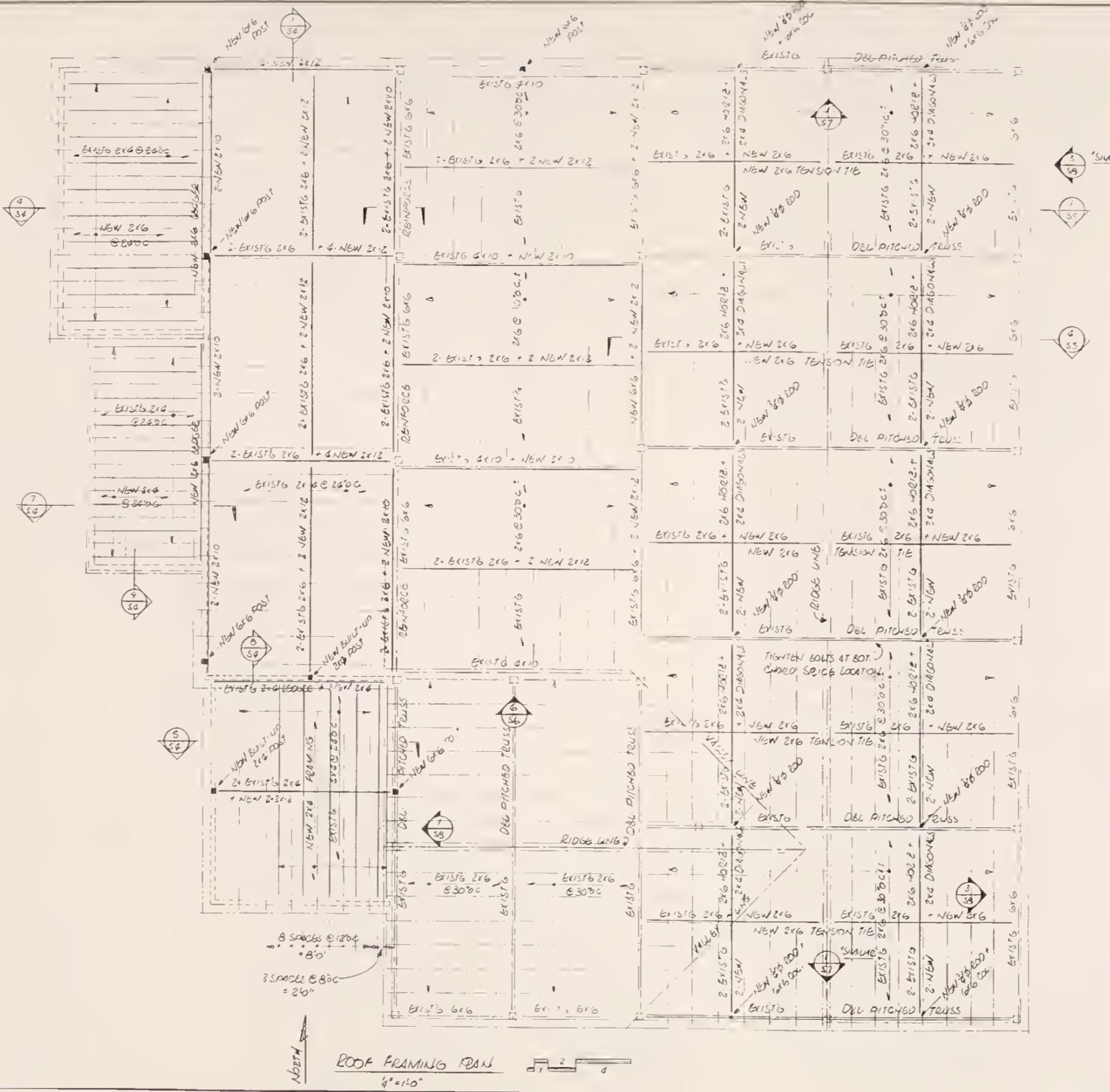
SITE PLAN AND GENERAL LAYOUT

APEX MILL
INTERMEDIATE LEVEL FRAMING PLAN

STATE OF MONTANA
DEPARTMENT OF STATE LANDS

**ASSOCIATED CONSTRUCTION
ENGINEERING INC.
AND
CTA ARCHITECTS ENGINEERS**





STRUCTURAL NOTES

GOVERNING CODES

iform Building Code 1988 Edition
merican Institute of Steel Construction 9th Edition
ERICAN CONCRETE INSTITUTE 118-89

DESIGN CRITERIA

ow Load: 10PSF + Drifting (Summer Use Only)
nd Load UBC - 75MPH. Exposure "C"
isnic: ZONE II (No Residual Snow)
il Bearing Pressure: Assumed 1 500 PSF on Native Gravels

MATERIALS

eeI Shapes & Plates - ASTM A36, F=36KSI
Ilded Connections - E70XX Electrodes
ltd Connections - ASTM A307 Bolts
adv Mixed Concrete - 3000 PSI Compressive Strength at 28 Days
ment - Type I, Slump = " to "
inforcing Steel ASTM A915 Grade G0
dimensional Framing Lumber - Rough Sawn Native Lodgepole Pine
equal
mbers - Rough Sawn Douglas Fir #1

FOUNDATION NOTES:

- All footings shall bear on undisturbed gravelly soils
Provide positive drainage away from structure as required to
dewater footing cuts during construction

CONCRETE:

Minimum Cover Requirements:
Cast Against Earth - 3"
Elsewhere - 1-1/2"

- Contractor shall have a clear understanding of scope of construction prior to installing members and connections. Contact Wes Kivinen at 388-3320 (ACEI) with questions regarding construction requirements.

- The structure shall be temporarily braced and shored in a safe manner as required to accomplish tasks indicated on construction documents.

- All pipes and plates in contact with native soils shall be primed black with 2-coats of manufacturers standard primer

- All members in contact with earth or concrete are to be pressure treated in compliance with AWPA standards C2 (lumber) and C9 (plywood). Utilize a semi-transparent solution as not to distort the natural color of the wood significantly.

- Re-roof areas above shear resistant frames where roof diaphragm nailing is called for with felt and bats similar to what had been used previously. Use galvanized nails in those areas.

- Provide addition wind girts at bays with broken girts described on sheet S2. These 2x6 girts will be in addition to the girt requirement described in section 11.5.

SITE PLAN AND GENERAL LAYOUT

**APEX MILL
BOOF FRAMING PLAN**

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

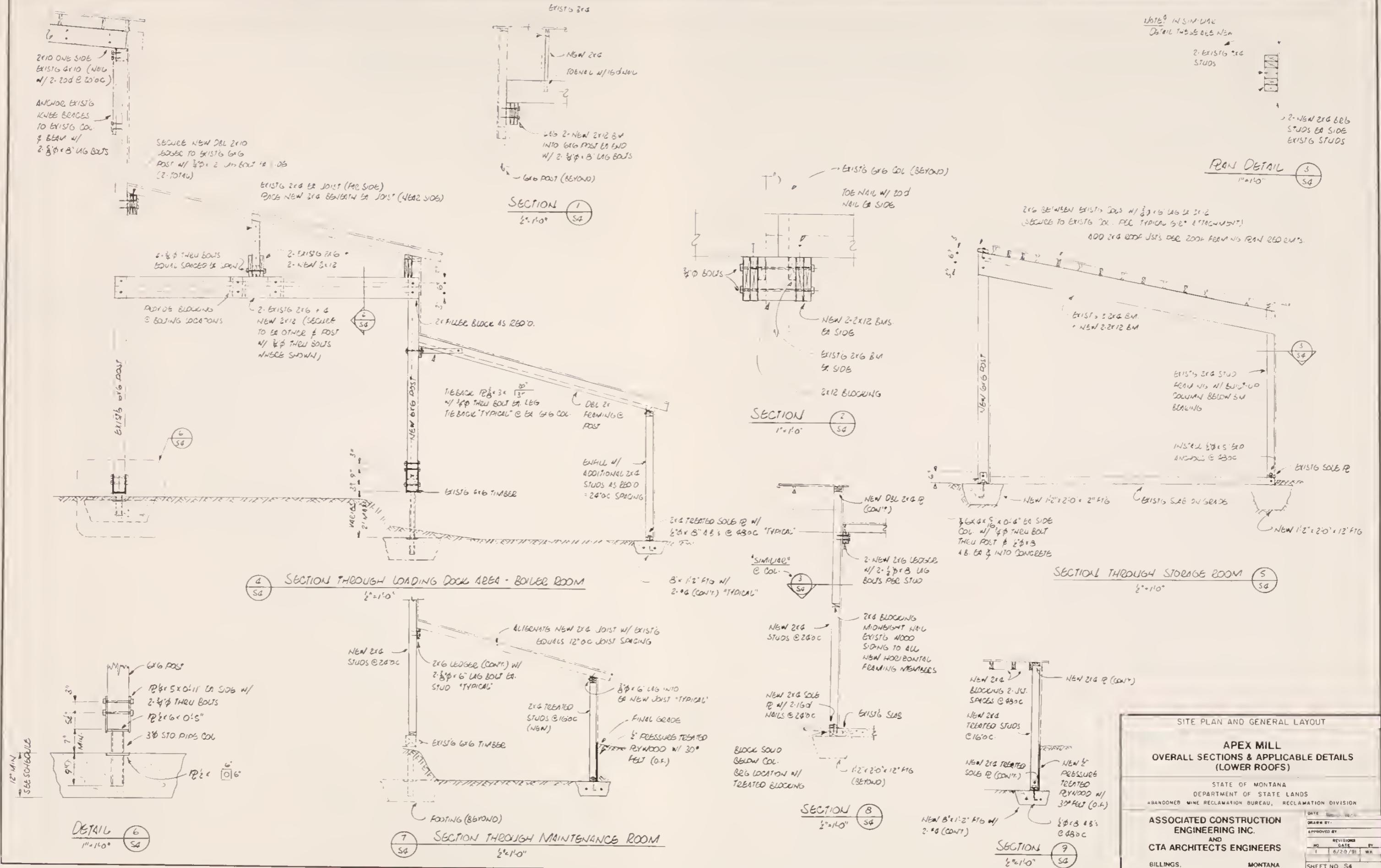
**ASSOCIATED CONSTRUCTION
ENGINEERING INC.**
AND
CTA ARCHITECTS ENGINEERS

BILLINGS, MONTANA

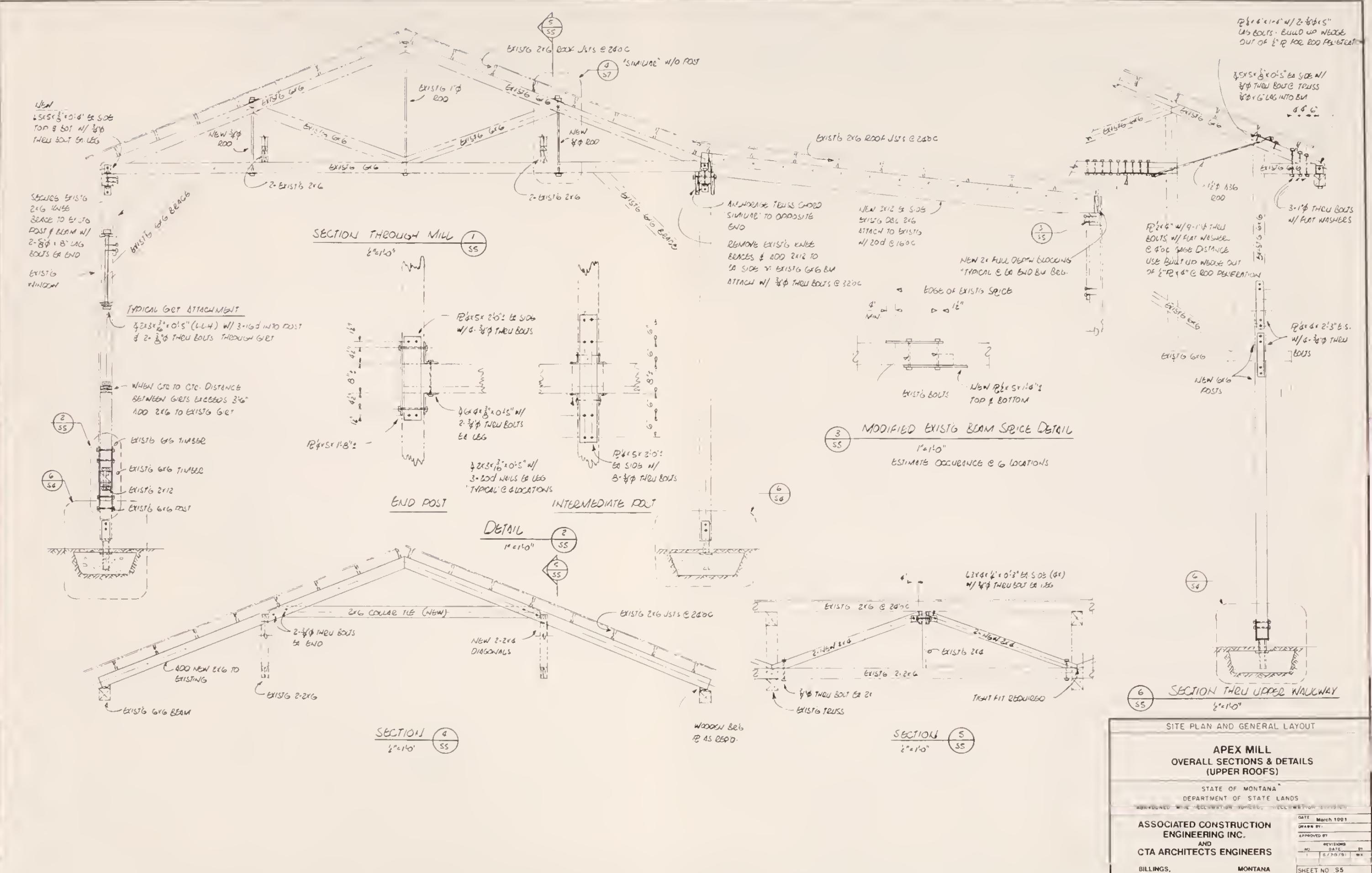
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DRAWN BY:	
APPROVED BY:	
REVISED BY:	
NO.	DATE
1	6/20/91

SHEET NO. S3

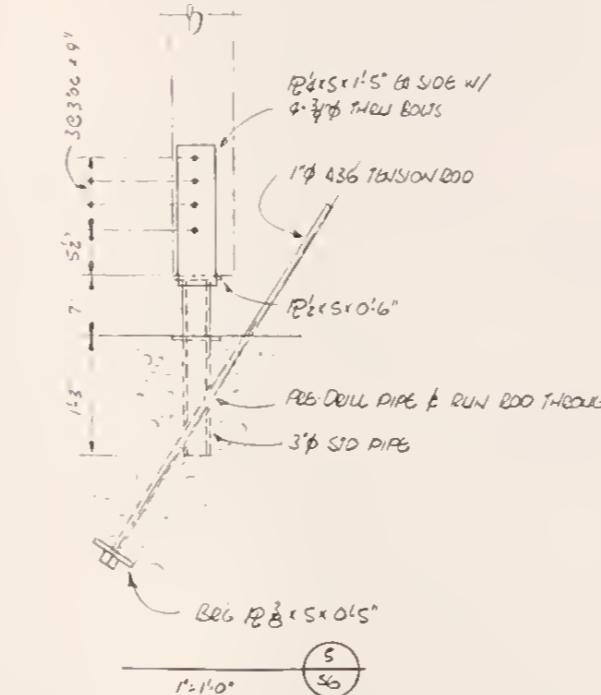
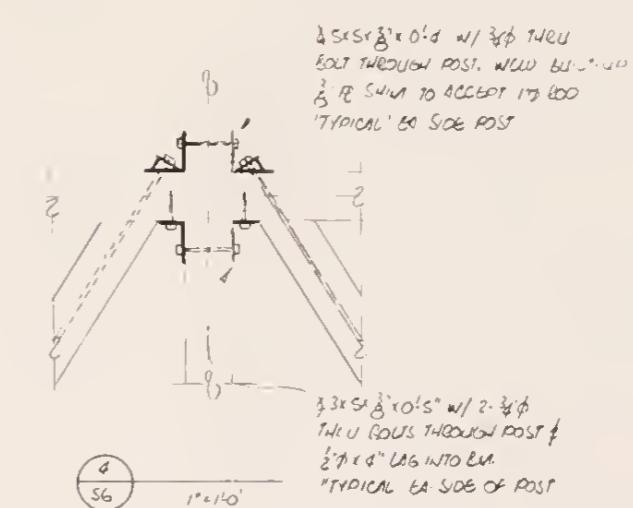
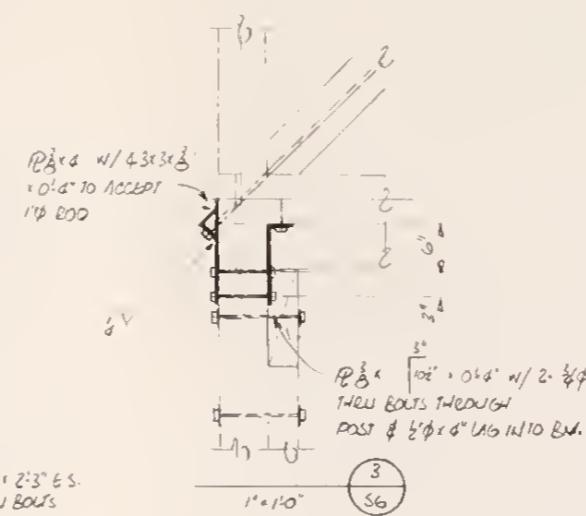
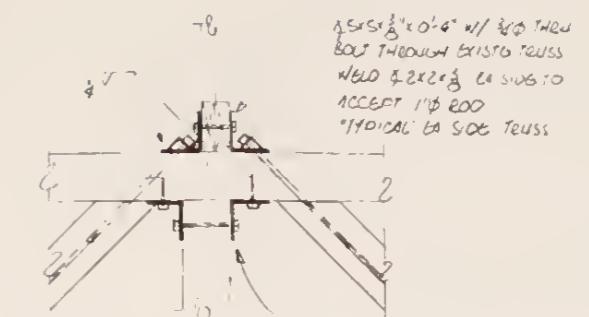
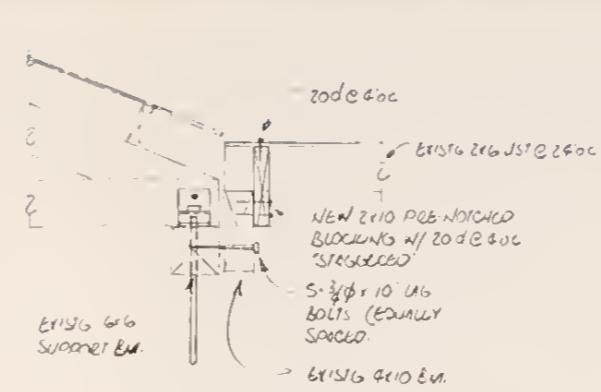
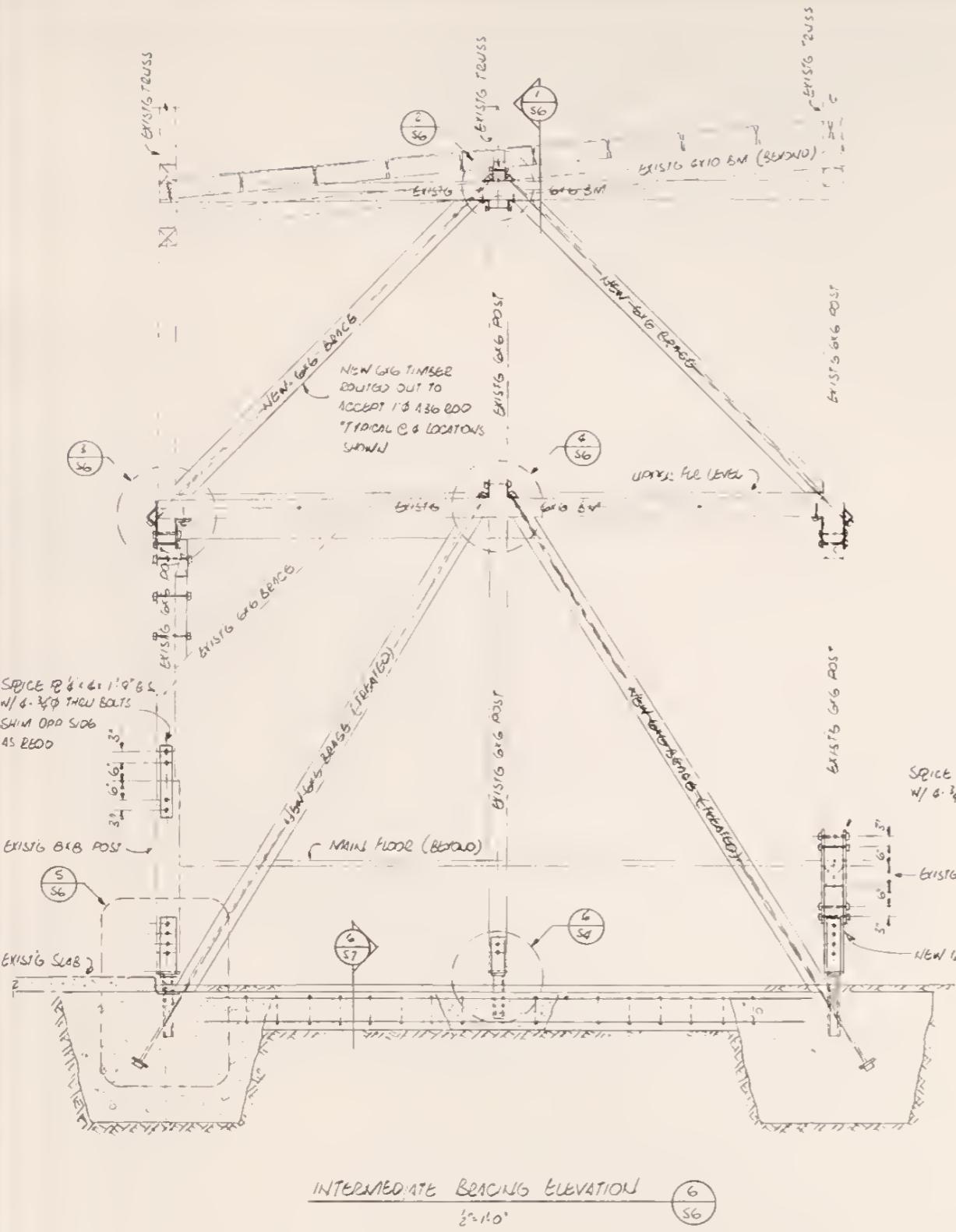












SITE PLAN AND GENERAL LAYOUT

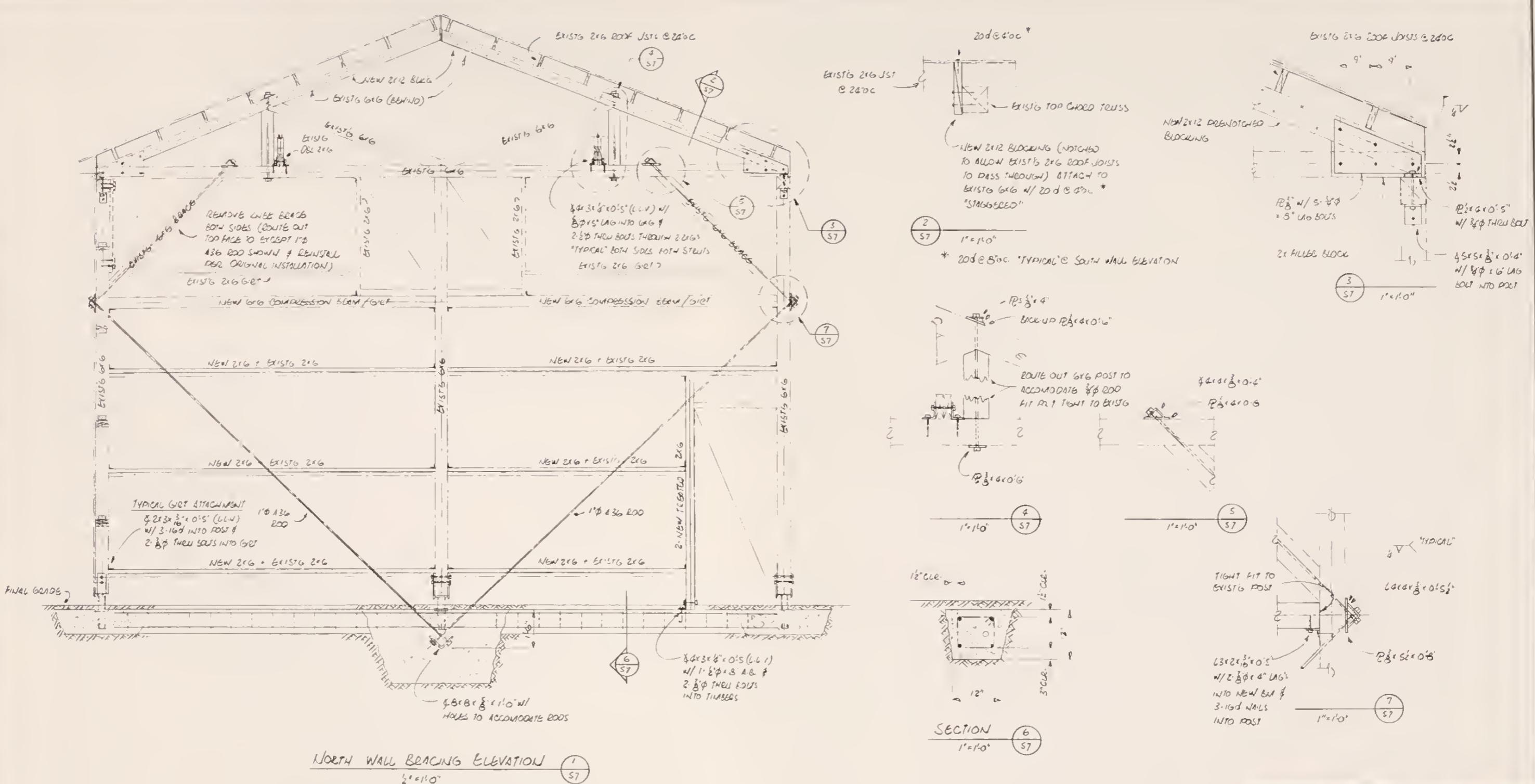
APEX MILL
BRACING ELEVATION & DETAILS
(INTERMEDIATE FRAME)

STATE OF MONTANA
DEPARTMENT OF STATE LANDS

**ASSOCIATED CONSTRUCTION
ENGINEERING INC.
AND
CTA ARCHITECTS ENGINEERS**

DATE	March 1991	
DRAWN BY:		
APPROVED BY		
REVISED BY		
BY	DATE	BY
	6/20/91	WK
SHEET NO 56		





North Wall Bracing Elevation

SOUTH WALL BRACING ELEVATION "SIMILAR" w/1/2
DOOR OPENING & UTILITIES 1/2" @ 436 ROOS SHEET ELEV
1/2" ROOS ARE SHOWN

SITE PLAN AND GENERAL LAYOUT

APEX MILL
BRACING ELEVATION & DETAILS
(NORTH & SOUTH FRAME)

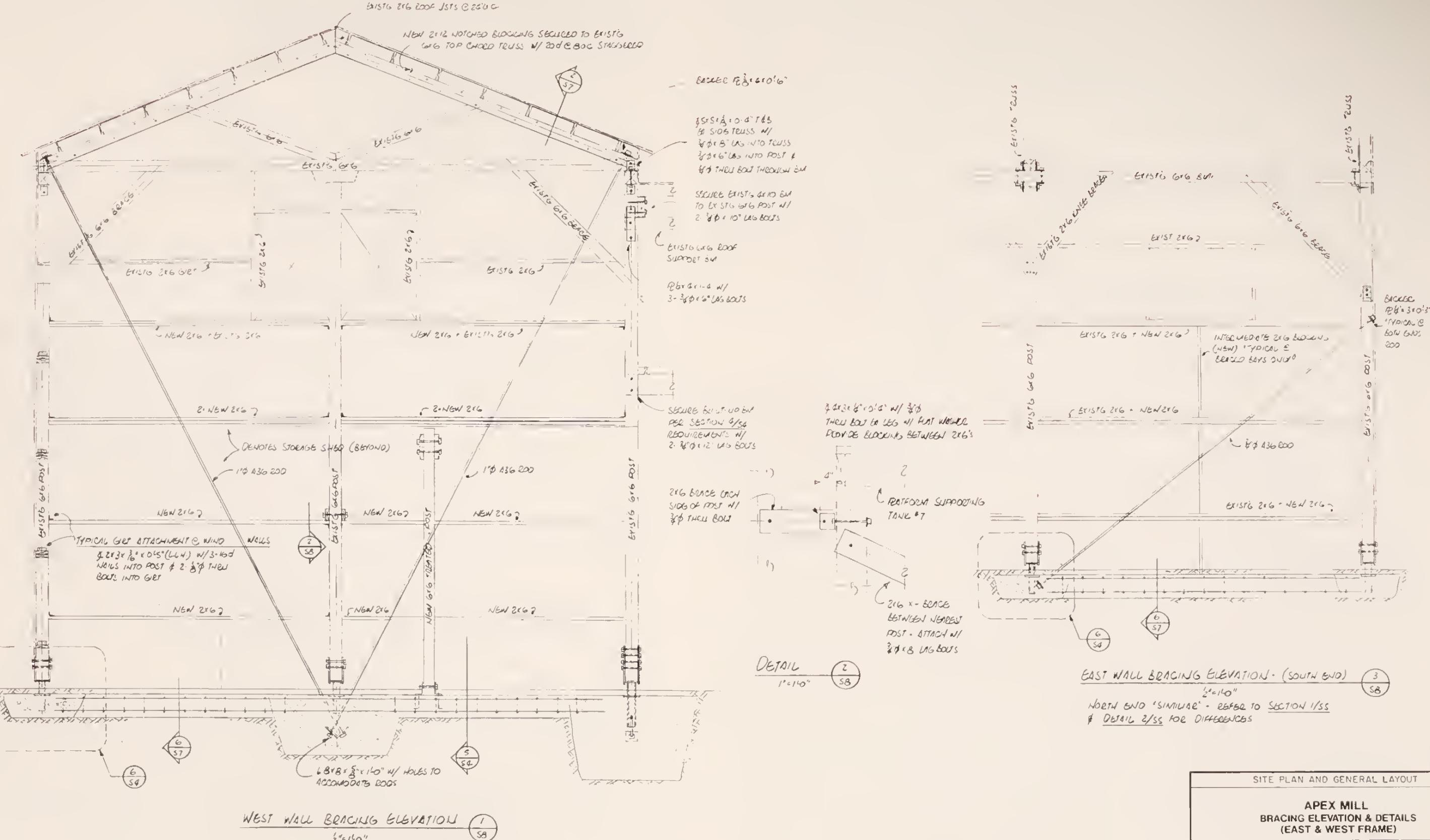
STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

ASSOCIATED CONSTRUCTION
ENGINEERING INC.
AND
CTA ARCHITECTS ENGINEERS

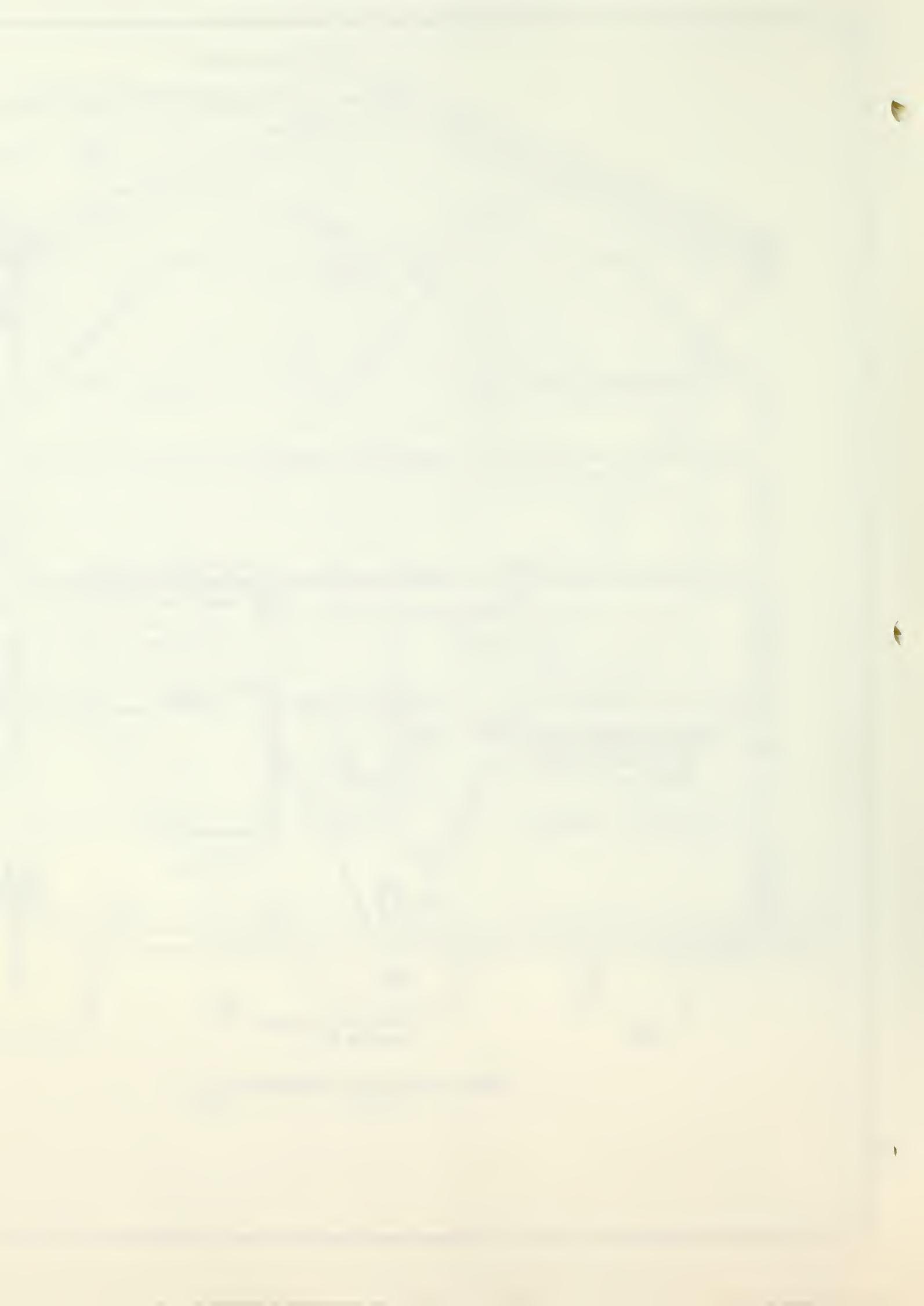
BILLINGS, MONTANA

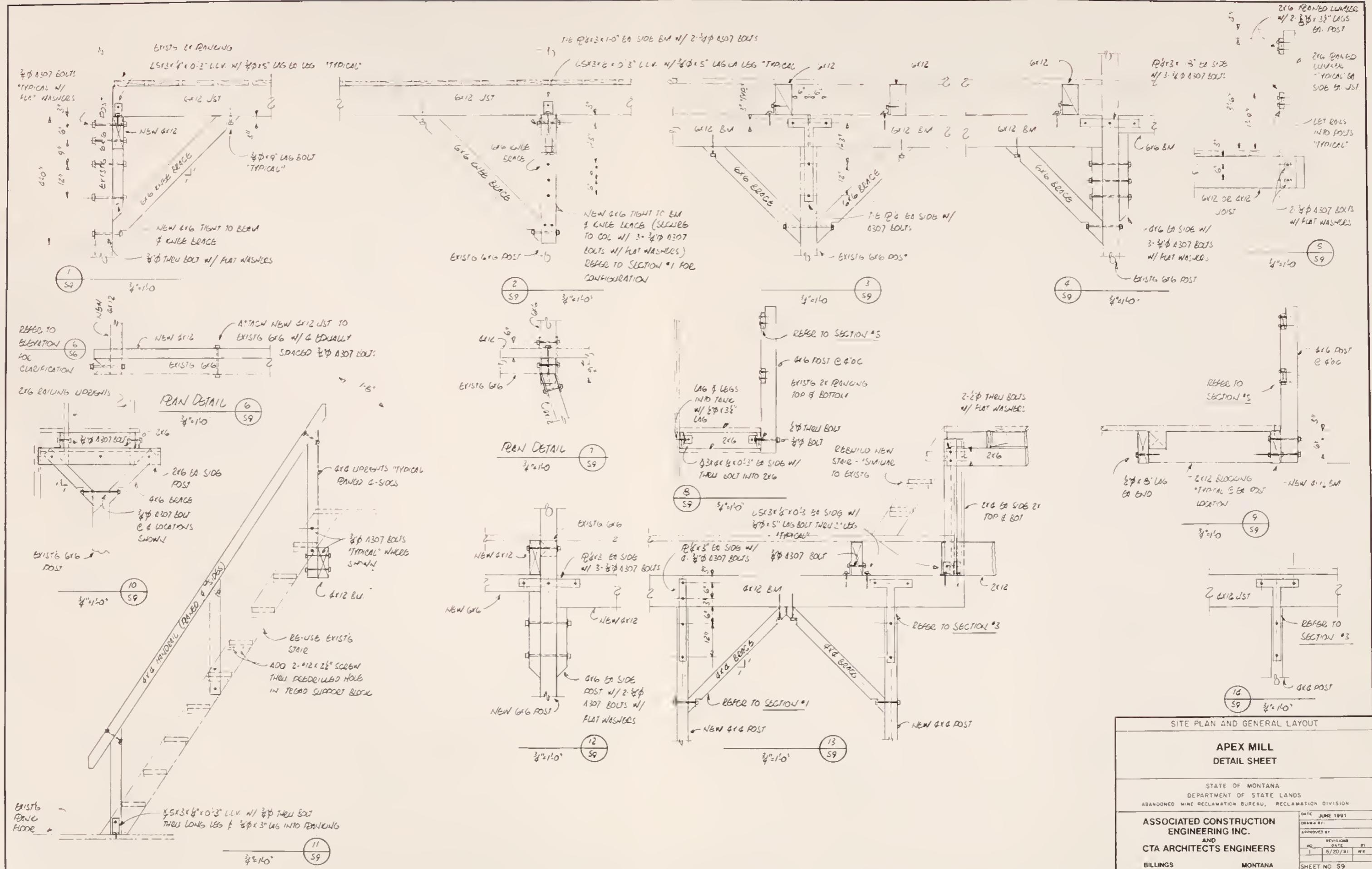
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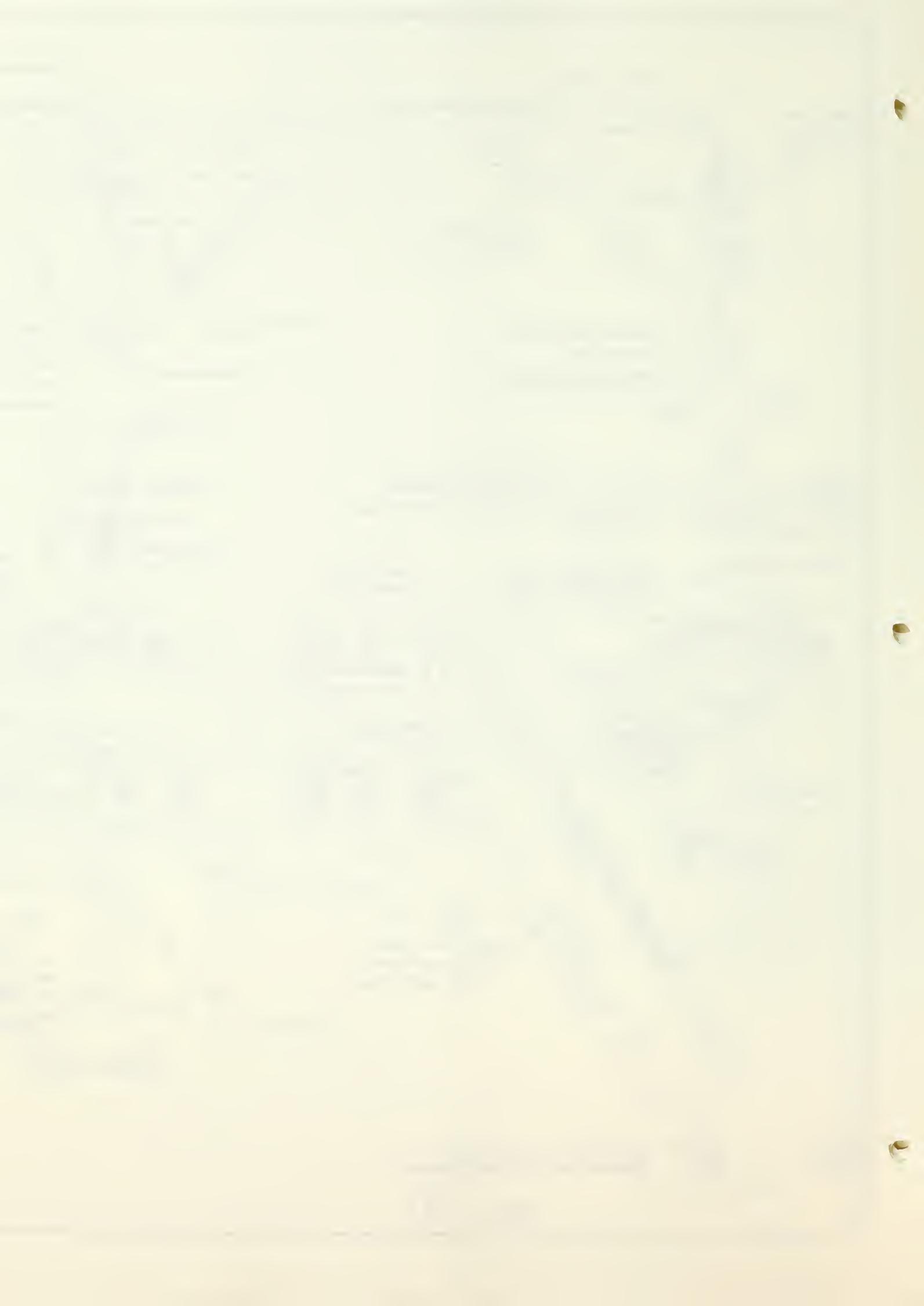


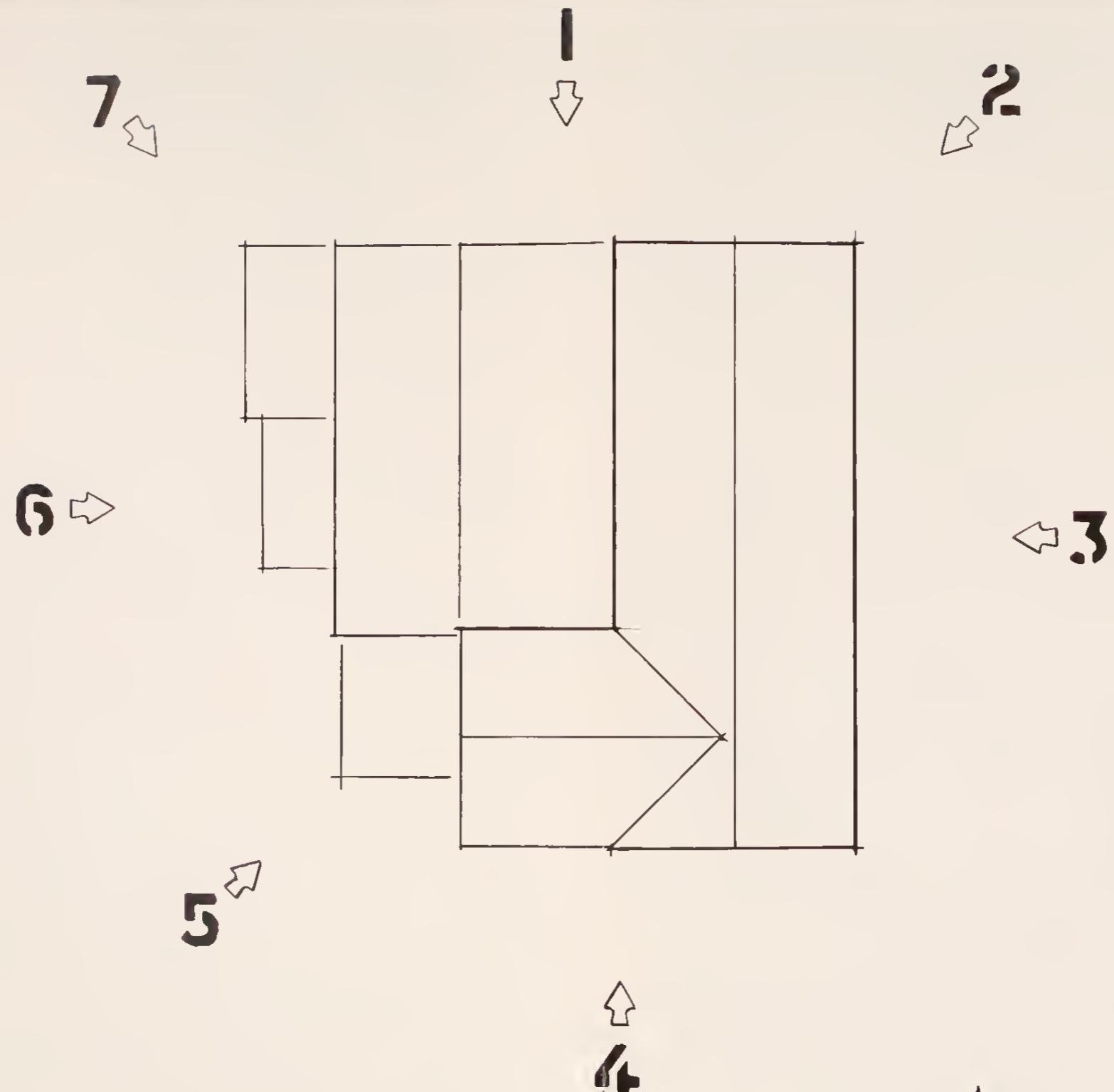


SITE PLAN AND GENERAL LAYOUT	
APEX MILL BRACING ELEVATION & DETAILS (EAST & WEST FRAME)	
STATE OF MONTANA DEPARTMENT OF STATE LANDS ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION	
ASSOCIATED CONSTRUCTION ENGINEERING INC. AND CTA ARCHITECTS ENGINEERS	
BILLINGS.	MONTANA
DATE: March 1991 DRAWN BY: APPROVED BY: REVISIONS NO. DATE 1 6/20/91 WR SHEET NO. SB	

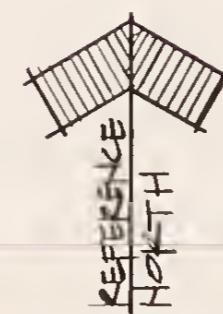








ROOF PLAN &
PHOTO KEY PLAN
 $\frac{1}{16}'' = 1'-0''$



SITE PLAN AND GENERAL LAYOUT	
APEX MILL STRUCTURAL STABILIZATION	
STATE OF MONTANA DEPARTMENT OF STATE LANDS APPROVAL: STATE REGULATORY BOARD, ALBERTA H. GRIFFIN	
DATE: _____	
DRAWN BY:	APPROVED BY:
REVISIONS:	REVISIONS:
NO.:	DATA:
MONTANA SHEET NO. 8-10	
CTA ARCHITECTS ENGINEERS AND ASSOCIATED CONSTRUCTION ENGINEERING INC. BILLINGS.	





REFERENCE PHOTO ELEVATION
LOOKING SOUTH

SITE PLAN AND GENERAL LAYOUT

**APEX MILL
STRUCTURAL STABILIZATION**

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

CTA ARCHITECTS ENGINEERS
AND
ASSOCIATED CONSTRUCTION
ENGINEERING INC.
BILLINGS, MONTANA

SHEET NO. S-11



REFERENCE PHOTO ELEVATION
LOOKING SOUTHWEST

2

SITE PLAN AND GENERAL LAYOUT

**APEX MILL
STRUCTURAL STABILIZATION**

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

CTA ARCHITECTS ENGINEERS
AND
ASSOCIATED CONSTRUCTION
ENGINEERING INC.
BILLINGS, MONTANA

DATE
DRAWN BY
APPROVED BY
NO. REVISIONS DATE BY
SHEET NO. S-12





REFERENCE PHOTO ELEVATION
LOOKING WEST

3

SITE PLAN AND GENERAL LAYOUT

**APEX MILL
STRUCTURAL STABILIZATION**

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
AGENCY OF THE STATE OF MONTANA
STRUCTURAL STABILIZATION

DATE: _____
DRAWN BY: _____
APPROVED BY: _____
REVISIONS: _____
BILLINGS, MONTANA

CTA ARCHITECTS ENGINEERS
AND
ASSOCIATED CONSTRUCTION
ENGINEERING INC.

SHEET NO. 3-13





REFERENCE PHOTO ELEVATION 4
LOOKING NORTH

SITE PLAN AND GENERAL LAYOUT

**APEX MILL
STRUCTURAL STABILIZATION**

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

DATE
DRAWN BY
APPROVED BY
NO. REVISIONS DATE
**CTA ARCHITECTS ENGINEERS
AND
ASSOCIATED CONSTRUCTION
ENGINEERING INC.
BILLINGS, MONTANA**

SHEET NO. S-14



REFERENCE PHOTO ELEVATION
LOOKING NORTHEAST

5

SITE PLAN AND GENERAL LAYOUT

**APEX MILL
STRUCTURAL STABILIZATION**

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

CTA ARCHITECTS ENGINEERS
AND
ASSOCIATED CONSTRUCTION
ENGINEERING INC.
BILLINGS, MONTANA

DATE
DRAWN BY
APPROVED BY
REVISIONS
SHEET NO. 9-15



REFERENCE PHOTO ELEVATION
Looking EAST

6

SITE PLAN AND GENERAL LAYOUT

**APEX MILL
STRUCTURAL STABILIZATION**

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MIN RECLAMATION BUREAU, RECLAMATION DIVISION

CTA ARCHITECTS ENGINEERS
AND
ASSOCIATED CONSTRUCTION
ENGINEERING INC.
BILLINGS, MONTANA

DRAWN BY
APPROVED BY
DIVISION
DATE
SHEET NO. S-16



REFERENCE PHOTO ELEVATION
LOOKING SOUTHEAST

7

SITE PLAN AND GENERAL LAYOUT

**APEX MILL
STRUCTURAL STABILIZATION**

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
Administration - Environment - Natural Resources - Transportation - Waterfowl

DATE: _____
DRAWN BY: _____
APPROVED BY: _____
REVISIONS NO.: _____ DATE: _____
CTA ARCHITECTS ENGINEERS
AND
ASSOCIATED CONSTRUCTION
ENGINEERING INC.
BILLINGS, MONTANA
SHEET NO. 8-17

ATTACHMENT 6

AS-BUILT DRAWINGS



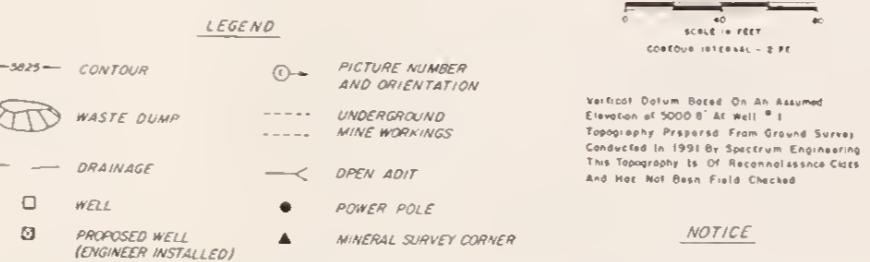
PICTURE 1 IS A PANORAMA LOOKING NORTH SHOWING THE MILL TAILINGS, THE APEX MILL, AND THE STATE PARK AOT.

VEHICLE TRAVEL WILL BE LIMITED
TO ROUTES FLAGGED ON-SITE BY
THE PROJECT ENGINEER.



— BOUNDARY OF TAILINGS
- - - CREST LINE OF EXISTING TAILINGS BERMS
- - - - CREST LINE OF TAILINGS - TO BE BUILT OR RECONSTRUCTED

- NOTES**
1. EXCAVATE AND REPLACE TO ELIMINATE PIPING, COMPACT WITH AT LEAST 3 PASSES OF WHEELED VEHICLE. (MUST BE MOIST.)
 2. PUSH AND SPREAD THE NON-TAILINGS MATERIAL INTO THE NW CORNER. (MAXIMUM FILL ELEVATION IS 4993'). COVER THE NON-TAILINGS MATERIAL WITH CUT FROM NOTE 3.
 3. CUT TO COVER NOTE 2 MATERIAL.
 4. UNSUITABLE MATERIALS WHICH HAVE BEEN SPREAD ON TOP OF THE TAILINGS IN THE NE POND WILL BE COLLECTED AND DEPOSITED IN AN EXCAVATED DISPOSAL PIT WITHIN THIS POND AREA. THE UNSUITABLE MATERIALS WILL BE COVERED WITH AT LEAST 1 FOOT OF SUITABLE MATERIAL FROM THE EXCAVATION. TWO FOOT HIGH CONTAINMENT BERMS WILL BE CONSTRUCTED IN THE INDICATED AREAS. THE IMPOUNDMENT AREA WITHIN THE BERMS WILL BE GRADED FLAT.



NOTICE

ADDITIONAL INFORMATION PERTAINING TO THIS SITE MAY EXIST IN THE DEPARTMENT OF STATE LANDS' FILES OR AT SPECTRUM ENGINEERING'S OFFICE. THIS MATERIAL IS AVAILABLE FOR REVIEW BY ANY INTERESTED PARTY.

MANY POTENTIAL HAZARDS EXIST THE EXTENT OF THESE HAZARDS IS NOT FULLY KNOWN CONTRACTORS AND OTHER PERSONS WORKING AT THE SITE SHALL APPRISE THEMSELVES OF THE CONDITIONS AND TAKE WHATEVER STEPS ARE DEEMED NECESSARY TO INSURE SAFETY WHILE PERFORMING THEIR DUTIES.

AS-BUILT DRAWING

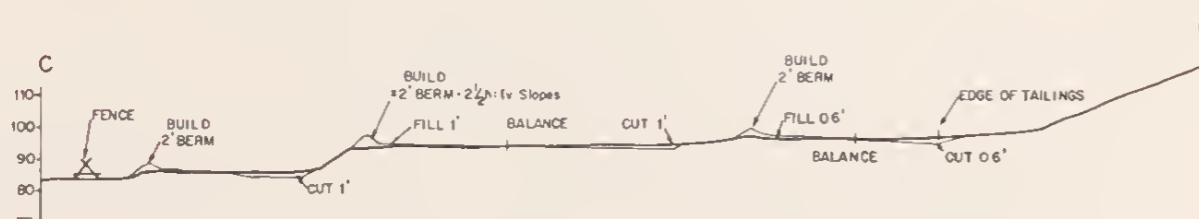
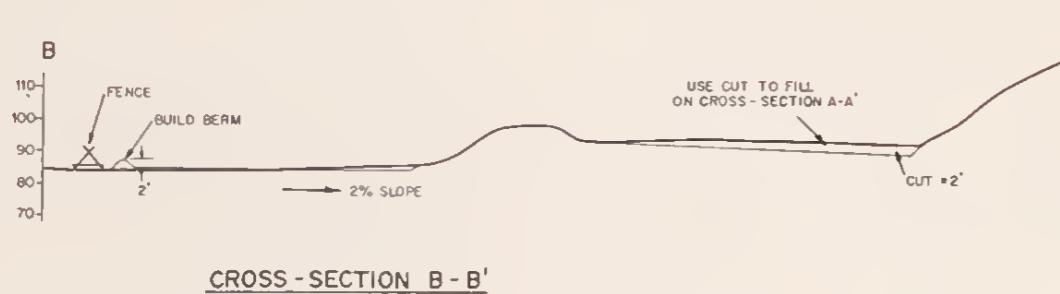
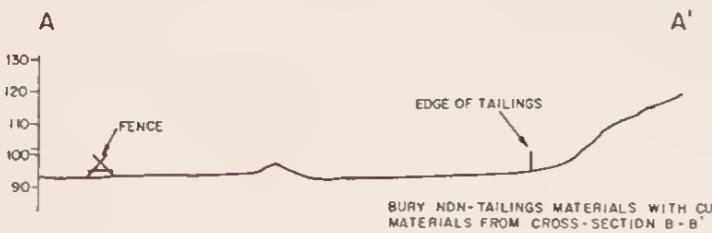
SITE PLAN AND GENERAL LAYOUT

APEX MILL
SECTION 7, T8S, R11W
BEAVERHEAD COUNTY, MONTANA

STATE OF MONTANA	
DEPARTMENT OF STATE LANDS	
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION	
DATE	March 1991
DRAWN BY	DLO
APPROVED BY	DM
REVISED BY	
NO	6/10/91
BY	DLO
As-Built	6/17/91
Sheet No	2

GRADING PLAN OBJECTIVES

1. SLOPE ALL TAILINGS SO THEY DRAIN TOWARDS THE CENTER OR TOWARDS THE HILL, AWAY FROM THE OUTSIDE.
2. SURROUND THE TAILINGS LEVELS WITH AT LEAST 2' HIGH BERMS $2\frac{1}{2}:\text{H}:1\text{V}$ SIDE SLOPES
3. COVER ANYTHING THAT IS NOT TAILINGS WITH TAILINGS.
4. WHEN COMPLETED, THE TAILINGS MUST APPEAR NATURAL WITH NO TIRE OR TRACK MARKS



WORK SUMMARY TABLE

ITEM	DESCRIPTION	ACTION	ESTIMATED QUANTITY	ACTUAL QUANTITY
BERM CONSTRUCTION	LOWER TAILINGS BERM SEDIMENT POND BERM NE POND TAILINGS BERM	CONSTRUCT BY REGRAINO CONSTRUCT BY REGRAINO CONSTRUCT BY REGRADINO	185 CU YDS 37 CU YDS 89 CU YDS 311 CU. YDS	
BURYING UNSUITABLE MATERIAL UNDER THE TAILINGS	MATERIAL FROM MILL VATS MATERIAL FROM TAILINGS SPILL ON TOP OF NE POND	GRADE AND COVER 1 EXCAVATE UNSUITABLE AND STOCKPILE. 2 SUB-EXCAVATE SUITABLE AND STOCKPILE. 3 BURY UNSUITABLE IN SUB-EXCAVATION HOLE. 4 COVER ALL UNSUITABLE MATERIAL WITH THE STOCKPILED SUITABLE MATERIAL.	444 CU YDS 150 CU YDS 400 CU. YDS 300 CU. YDS 400 CU. YDS 1694 CU YDS	
WATER PIPELINE	EROSION FROM PIPELINE	EXCAVATE PIPELINE AREA REPLACE AND COMPACT	275 CU YDS 275 CU. YDS	
TAILINGS GRAZING	NORTH-CENTRAL POND SWALE FROM HILLSIDE TO SEDIMENT POND	CUT AND FILL GRADE A SHALLOW SWALE GOING PAST THE MILL	110 CU YDS 230 CU. YDS	
REVEGETATION	SAGEBRUSH	PLANT CONTAINERIZED STOCK (8'-1" HIGH) TRANSPLANT SAGEBRUSH (NOT OVER 2 FEET HIGH)	100 UNITS 20 UNITS	125 UNITS 0 UNITS
WATER	TAILINGS AND PIPING SAGEBRUSH WATERING ROADS AND OTHER AREAS	DUST SUPPRESSION AND COMPACTION WATER AFTER PLANTING DUST SUPPRESSION	4.2 KGALS 0.3 KGALS 10.0 KGALS 15.0 KGALS	14.5 KGALS

WORK DESCRIPTION

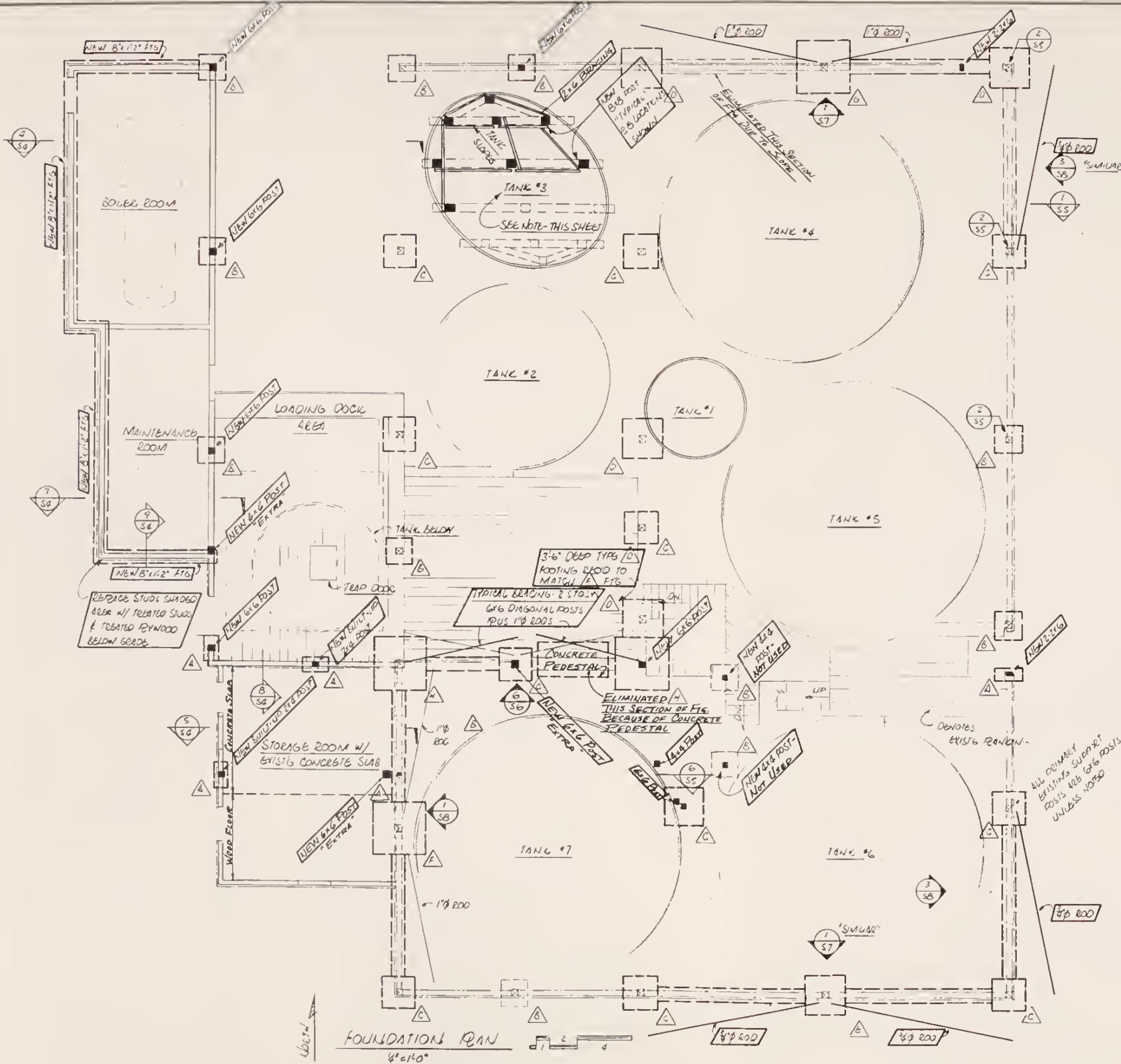
- RECONSTRUCT CONTAINMENT BERMS ALONG SEVERAL TAILING PONDS.
- DISPOSE OF MATERIALS DUMPED ON TOP OF THE TAILINGS BY BURYING DURING THE TAILINGS REGRAING.
- REPAIR AN AREA DAMAGED BY WATER PIPING BY EXCAVATING AND RECOMPACTING THE DAMAGE AREA.
- REGRADE THE MILL TAILINGS SO THAT WATER LANDING ON OR FLOWING OVER THE TAILINGS DRAINS AWAY FROM GRASSHOPPER CREEK. DISPOSE OF SAGEBRUSH DAMAGED DURING REGRAING.
- PLANT CONTAINERIZED STOCK OF BASIN BIG SAGEBRUSH AND TRANSPLANT SAGEBRUSH PLUGS ON ALL AREAS WHERE SAGEBRUSH WAS DISTURBED DURING REGRAING. EIGHTY (80) PERCENT OR GREATER OF THE ROOTS MUST BE DUG UP WITH THE TRANSPLANTS. WATER ALL PLANTED SAGEBRUSH IMMEDIATELY AFTER PLANTING AND WATER ONCE MORE PRIOR TO DEMOBILIZING FROM THE JOB SITE. WHEN PLANTING THE SAGEBRUSH SPREAD THE ROOT SYSTEM AND POINT THE ROOTS DOWN.
- PROVIDE WATER AS NECESSARY FOR DUST SUPPRESSION AND COMPACTION AND FOR WATERING THE NEWLY PLANTED SAGEBRUSH.
- APEX MILL STABILIZATION (COVERED ON A DIFFERENT SITE PLAN SHEET)

SITE PLAN AND GENERAL LAYOUT

APEX MILL
SECTION 7, TBS, RIHW
BEAVERHEAD COUNTY, MONTANA

STATE OF MONTANA	
DEPARTMENT OF STATE LANDS	
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION	
SPECTRUM ENGINEERING	
Mining and Civil Engineers	
DATE	March 1991
DRAWN BY	OLD
APPROVED BY	BM
NO.	1
REVISED	BY
BASE	OLD
1	8/20/1991
As-Built	1/8/1992
SHEET NO. 3	

AS-BUILT DRAWING



TANK #3 - EXISTING POST & BRACING REPLACEMENT PROCEDURE

- 1.) JACK & SHORE TANK AS REQUIRED FOR REMOVAL OF EXISTING POSTS.
- 2.) REMOVE EXISTING ROTTED TIMBER POSTS & BRACING.
- 3.) INSERT NEW PRESSURE TREATED 8x8 POSTS ± 4' LONG AT 8 SHADDED LOCATIONS NOTED.
- 4.) POSTS ARE TO BEAR DIRECTLY ON THE EXISTING SUBSURFACE CONCRETE SLAB AT LOCATIONS OF EXISTING POSTS.
- 5.) REMOVE JACKS & SHORING.
- 6.) PROVIDE 2x6 DIAGONAL BRACE AT EACH NEW POST LOCATION POSITIONED SIMILAR TO EXISTING. (ESTIMATE 4 BRACES X 10' LONG)
- 7.) TIGHTEN STEEL BANDS ON REINFORCED TANKS

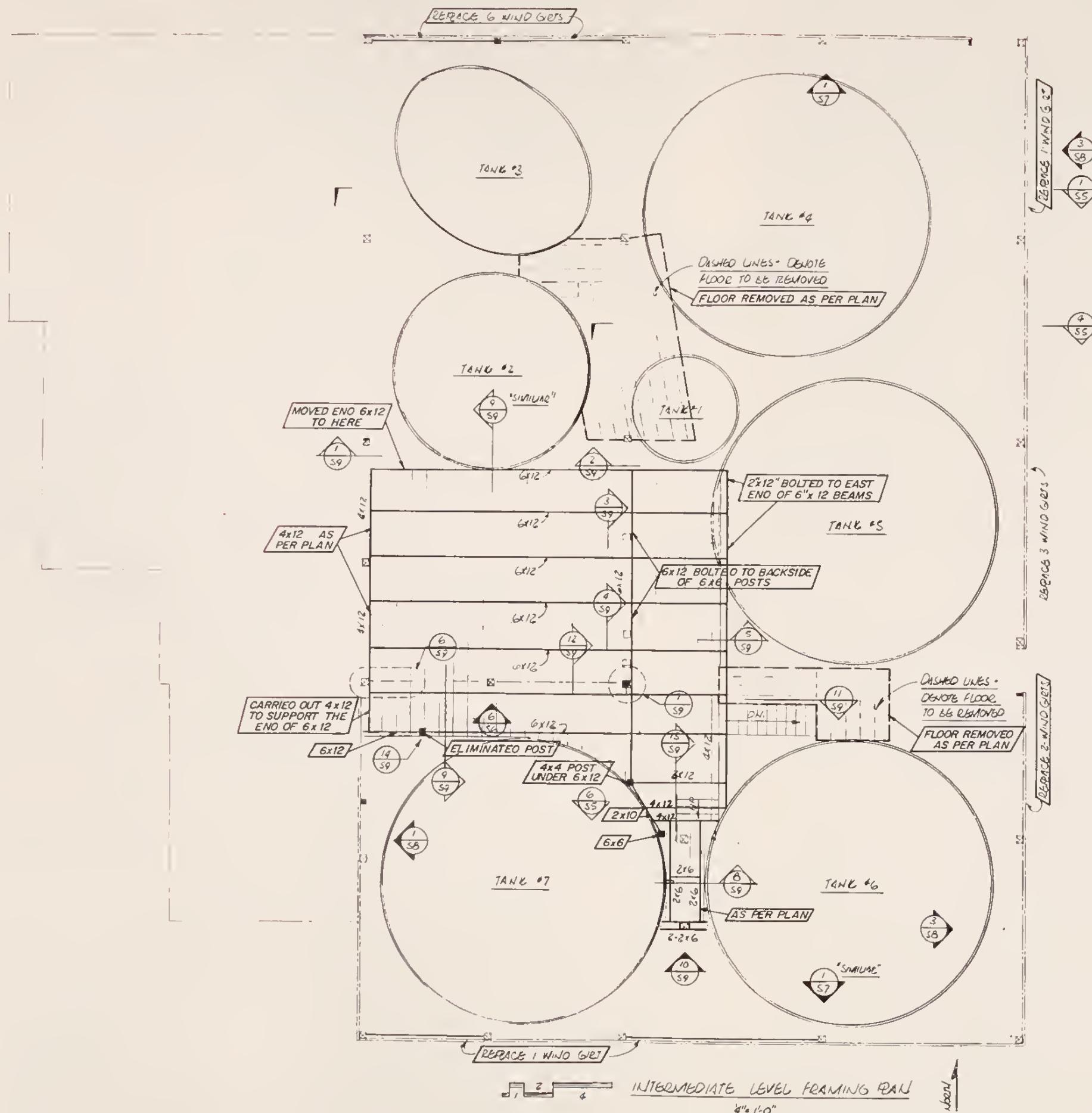
FOOTING SCHEDULE		
NO.	SIZE	REINFORCEMENT
A	1/2" x 2'0" x 1'0"	NONE REQ'D
B	2'0" x 2'0" x 1'0"	NONE REQ'D
C	2'6" x 2'6" x 1'0"	NONE REQ'D
D	3'0" x 3'0" x 1'0"	3-#6 EA WAY
E	3'0" x 3'0" x 2'6"	NONE REQ'D
F	6'0" x 6'0" x 2'6"	NONE REQ'D
G	6'0" x 6'0" x 3'0"	NONE REQ'D
H	8'0" x 6'0" x 3'6"	NONE REQ'D

DIMENSIONAL NOTES:

SCALE PANS, SECTIONS & DETAILS FOR QUANTITY TAKEOFFS.
ALL SCALED DRAWINGS TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION

SITE PLAN AND GENERAL LAYOUT		
APEX MILL FOUNDATION PLAN		
STATE OF MONTANA DEPARTMENT OF STATE LANDS ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION		
ASSOCIATED CONSTRUCTION ENGINEERING INC. AND CTA ARCHITECTS ENGINEERS BILLINGS, MONTANA		
DATE	MARCH 1991	
DRAWN BY		
APPROVED BY		
REVISED DATE		
NO.	1	6/20/91
As-Drawn	12-11-91	DLG
SHEET NO. S1		





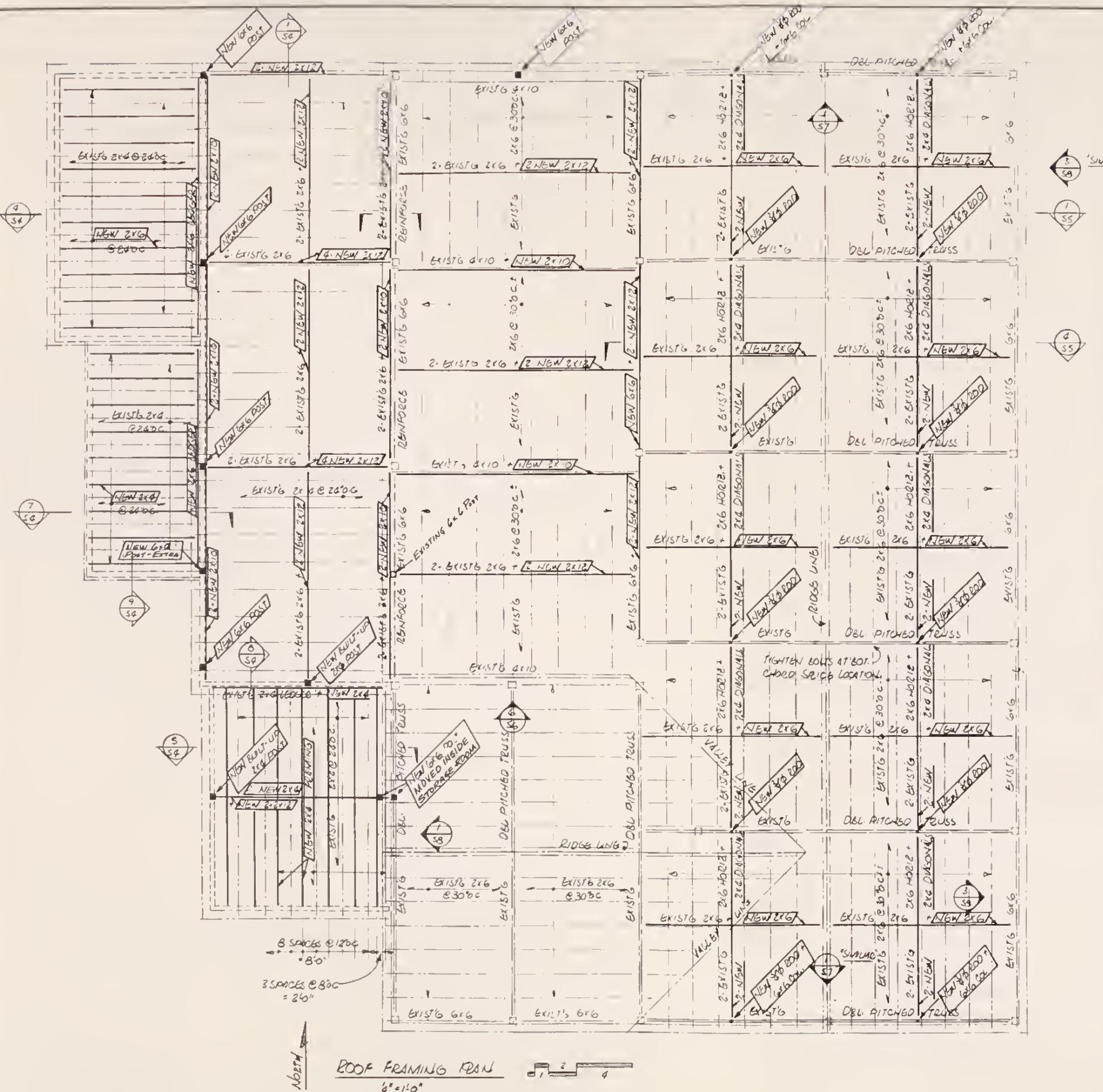
UPPER LEVEL FRAMING REPLACEMENT PROCEDURE

- 1) REMOVE ALL EXISTING FRAMING - NUMBER AND JOCKEY FOR RE-USE.
- 2) REMOVE EXISTING SUPERSTRUCTURE AS REQUIRED - BEAMS, COLUMNS, STAIRS, ETC THAT ARE SUPPORTING FLOOR ONLY! AND STOCKPILE AS REQUIRED FOR LATER USE.
- 3) LOCATE NEW SUPPORT COLUMNS AT LOCATIONS SHOWN ON THE DRAWINGS. POUR FOOTINGS AT NEW POST LOCATIONS UTILIZING MODIFIED DETAIL 6/3.4 AT NEW POST LOCATIONS.
- 4) ERECT NEW SUPERSTRUCTURE PER DETAIL REQUIREMENTS. USE #1 GRADE LOGS/POLE AND AIR DRYED ROUGH SAWN TIMBERS (RELATIVELY CLEAR OF KNOTS & CHECKS) FOR BEAMS, JOISTS, AND COLUMNS.
- 5) INSTALL HANDRAILS AND STANDARDS USING PREGO 10W DRYED DOUGLAS #2 OR BETTER.
- 6) INSTALL STOCKPILED 2X FRAMING W/ 2-40D PINE BURN NAILS AT EACH SUPPORT. WHERE ORIGINAL FRAMING IS NOT SUITABLE, REPLACE WITH ANOTHER ORIGINAL FRAMING.
- 7) MODIFY CONCRETE AND INSTALL STAIRS PER DETAIL REQUIREMENTS.

SITE PLAN AND GENERAL LAYOUT		
APEX MILL		
INTERMEDIATE LEVEL FRAMING PLAN		
STATE OF MONTANA DEPARTMENT OF STATE LANDS ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION		
ASSOCIATED CONSTRUCTION ENGINEERING INC. AND CTA ARCHITECTS ENGINEERS		
BILLINGS, MONTANA		
DATE: March 1991 DRAWN BY: APPROVED BY: NO. DATE BY 1 6/20/91 WX As-Built 12-17-1991 DLO SHEET NO. S2		

AS-BUILT DRAWING



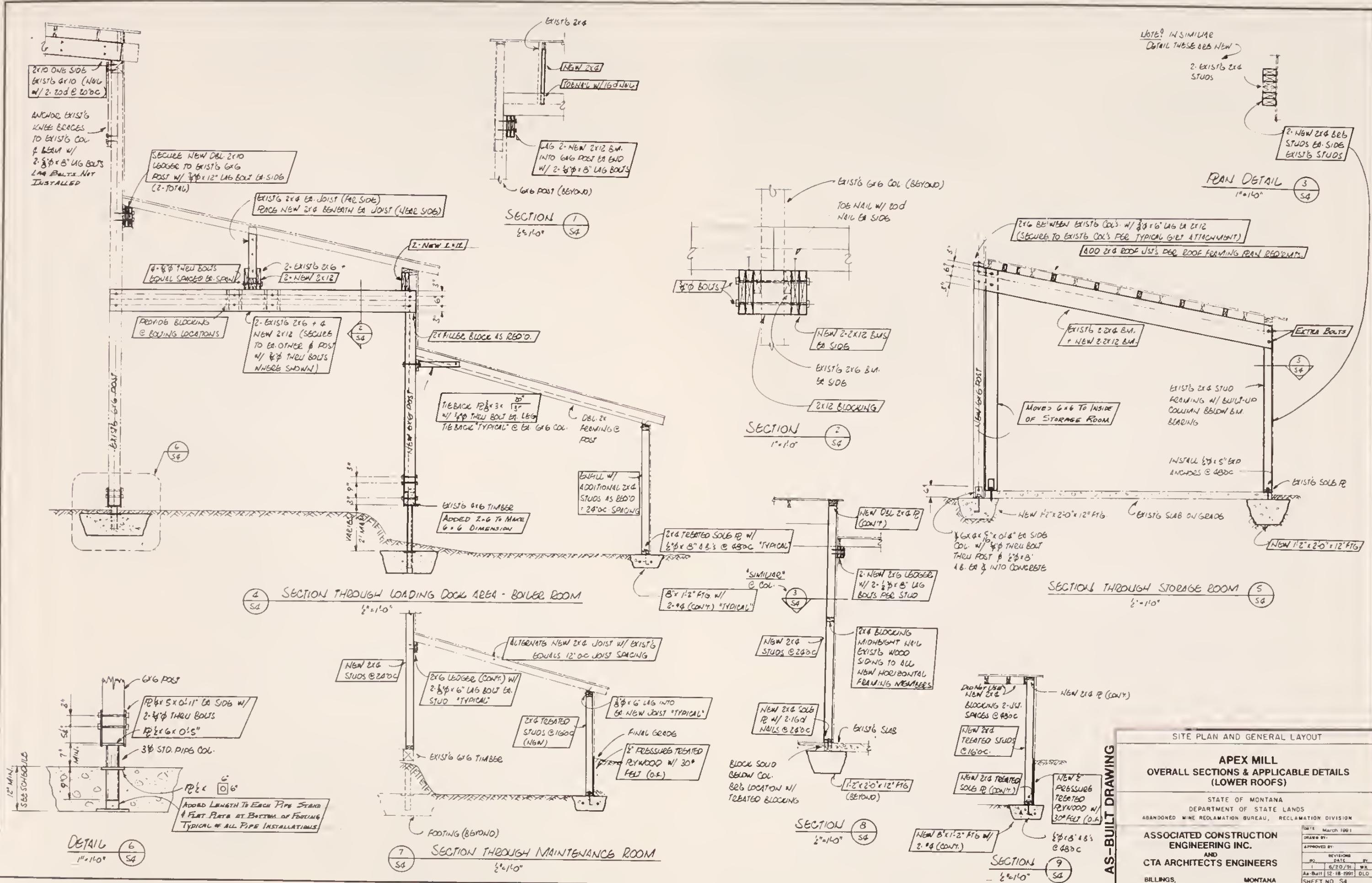


AS-BUILT DRAWING

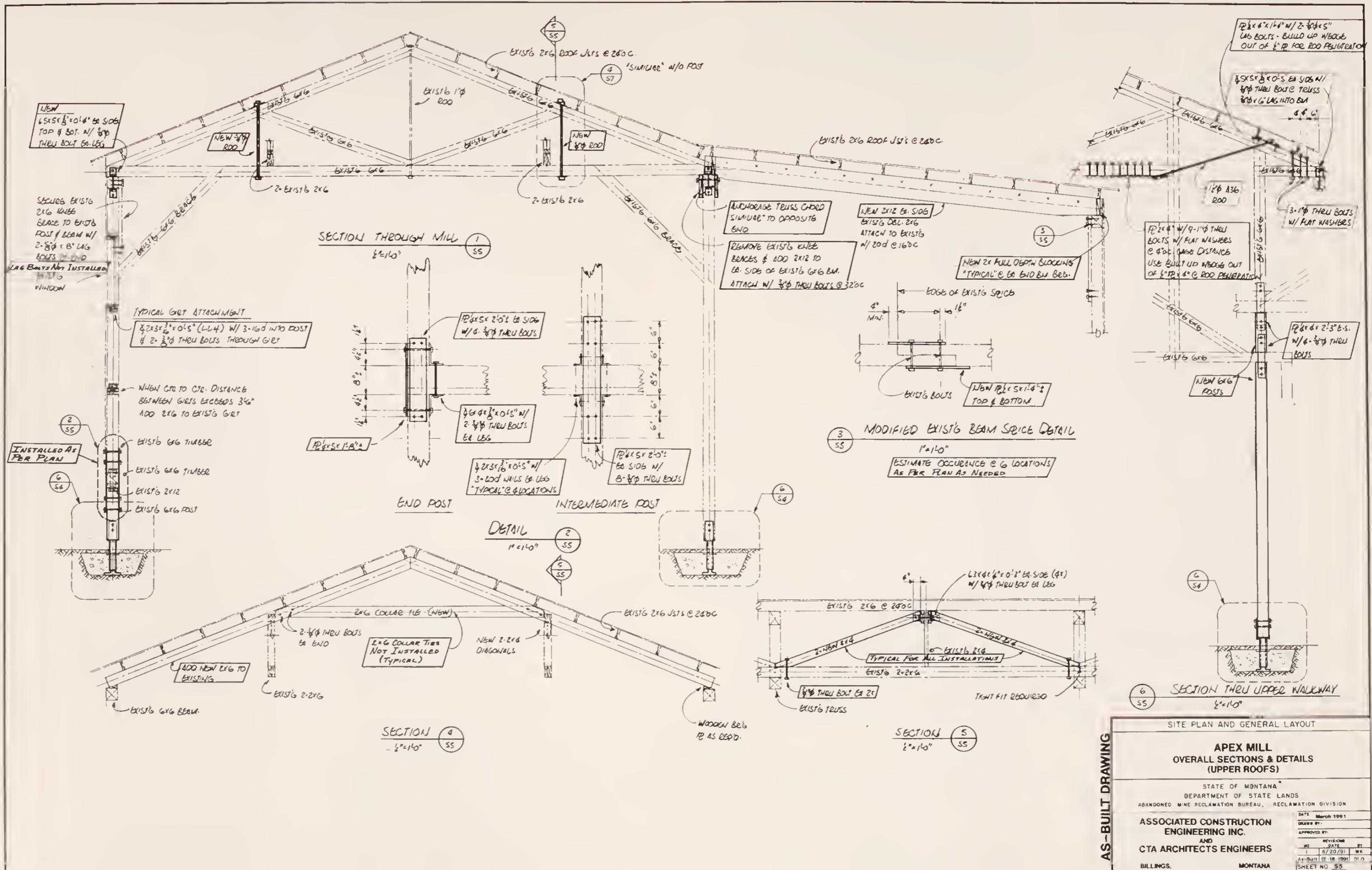
SITE PLAN AND GENERAL LAYOUT
APEX MILL
ROOF FRAMING PLAN

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
DRAWN BY:
APPROVED BY:
REVISIONS DATE BY:
1 6/20/91 WK
ASSOCIATED CONSTRUCTION
ENGINEERING INC.
AND
CTA ARCHITECTS ENGINEERS
BILLINGS, MONTANA
SHEET NO. 53

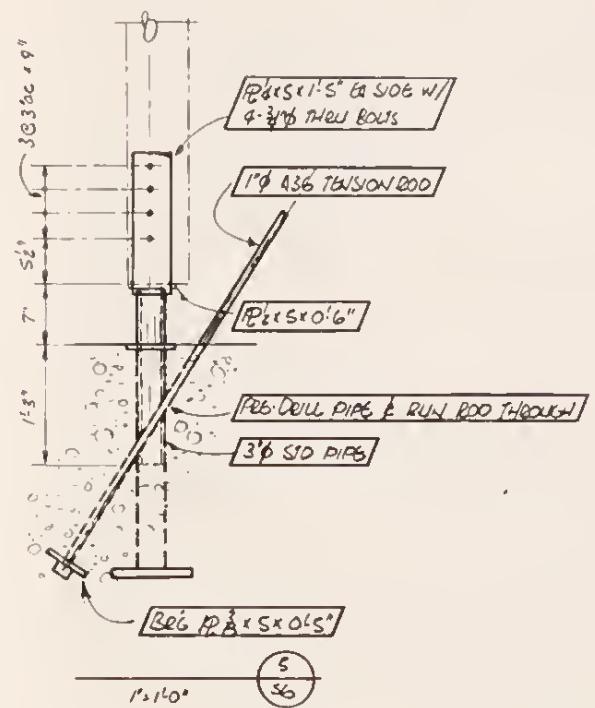
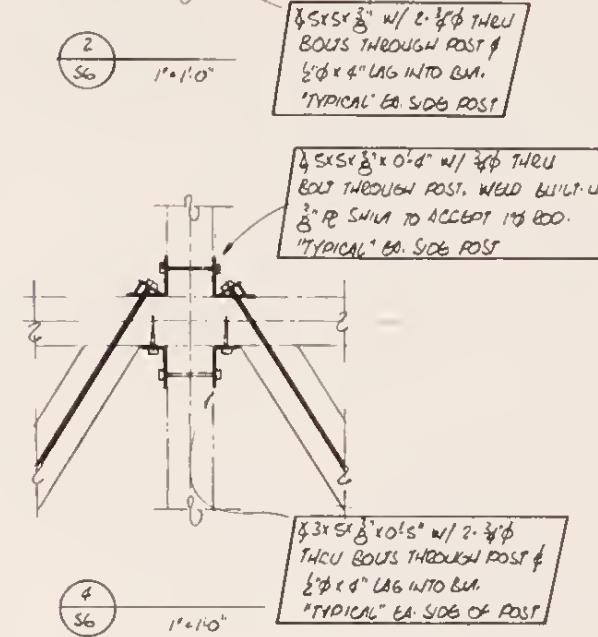
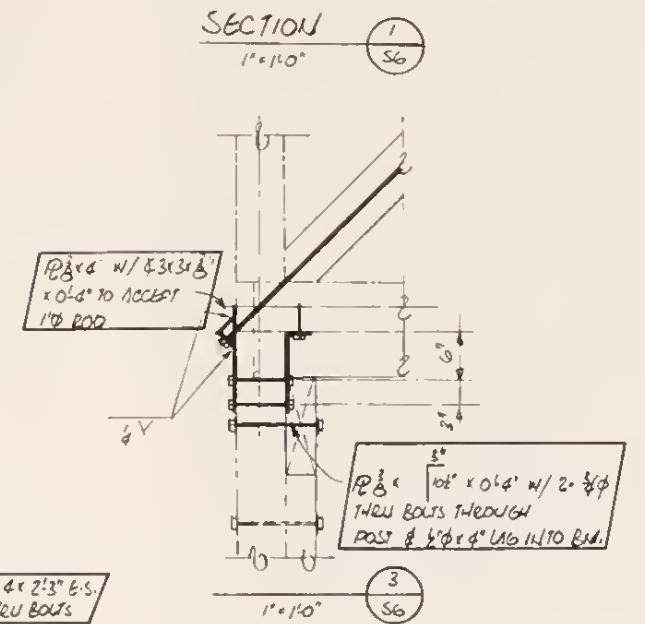
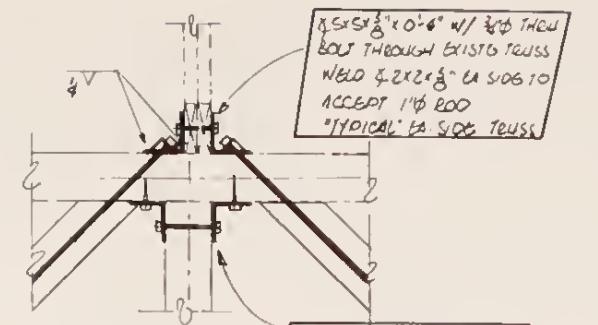
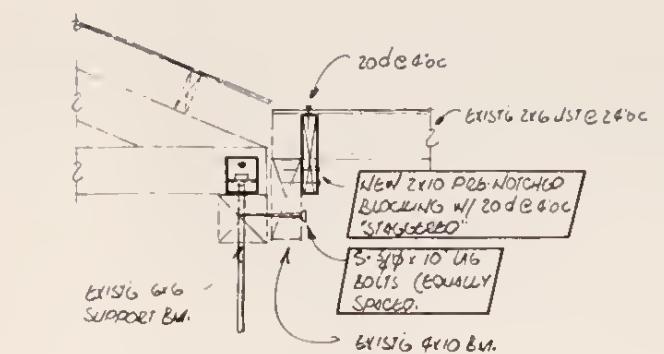
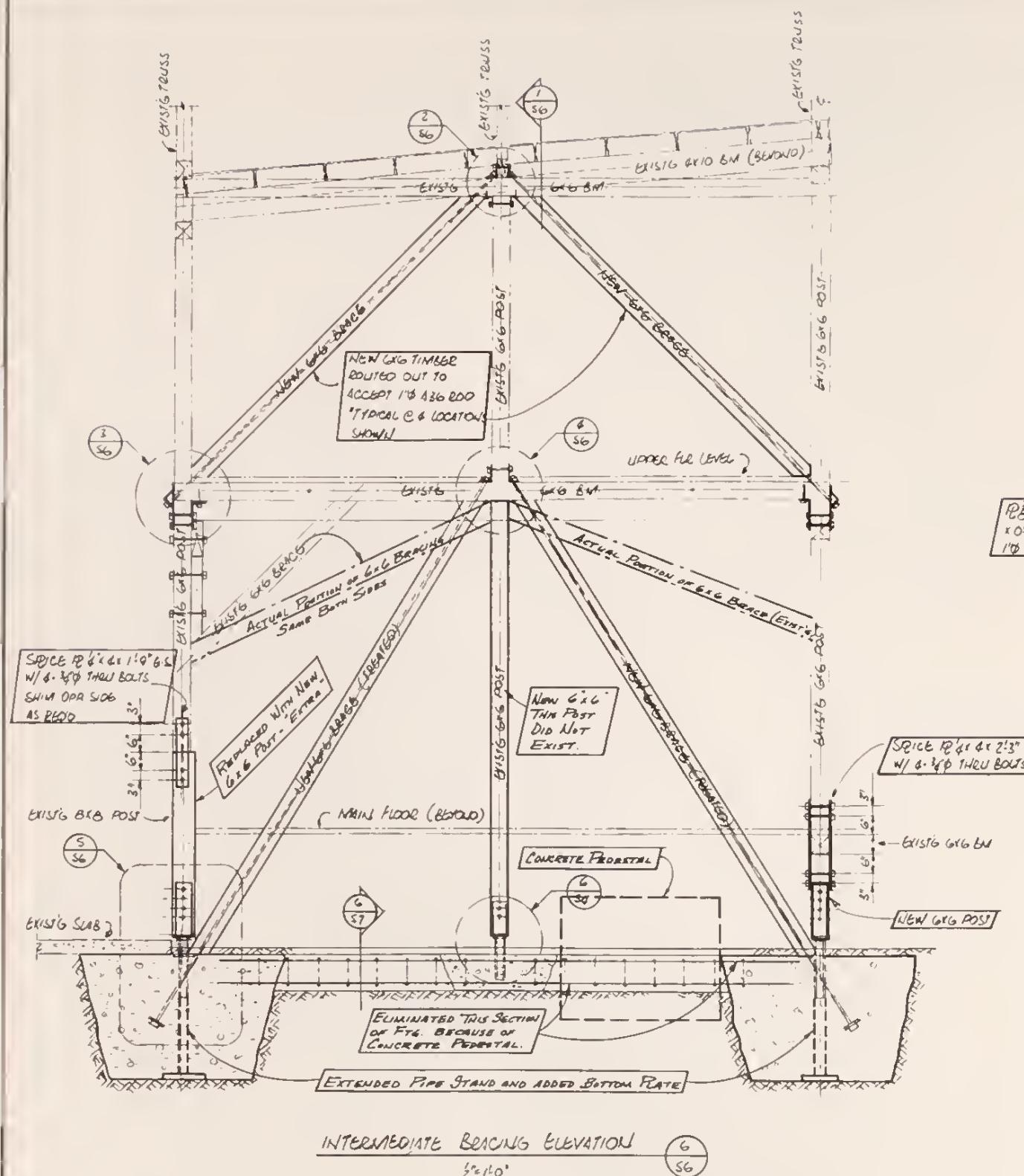










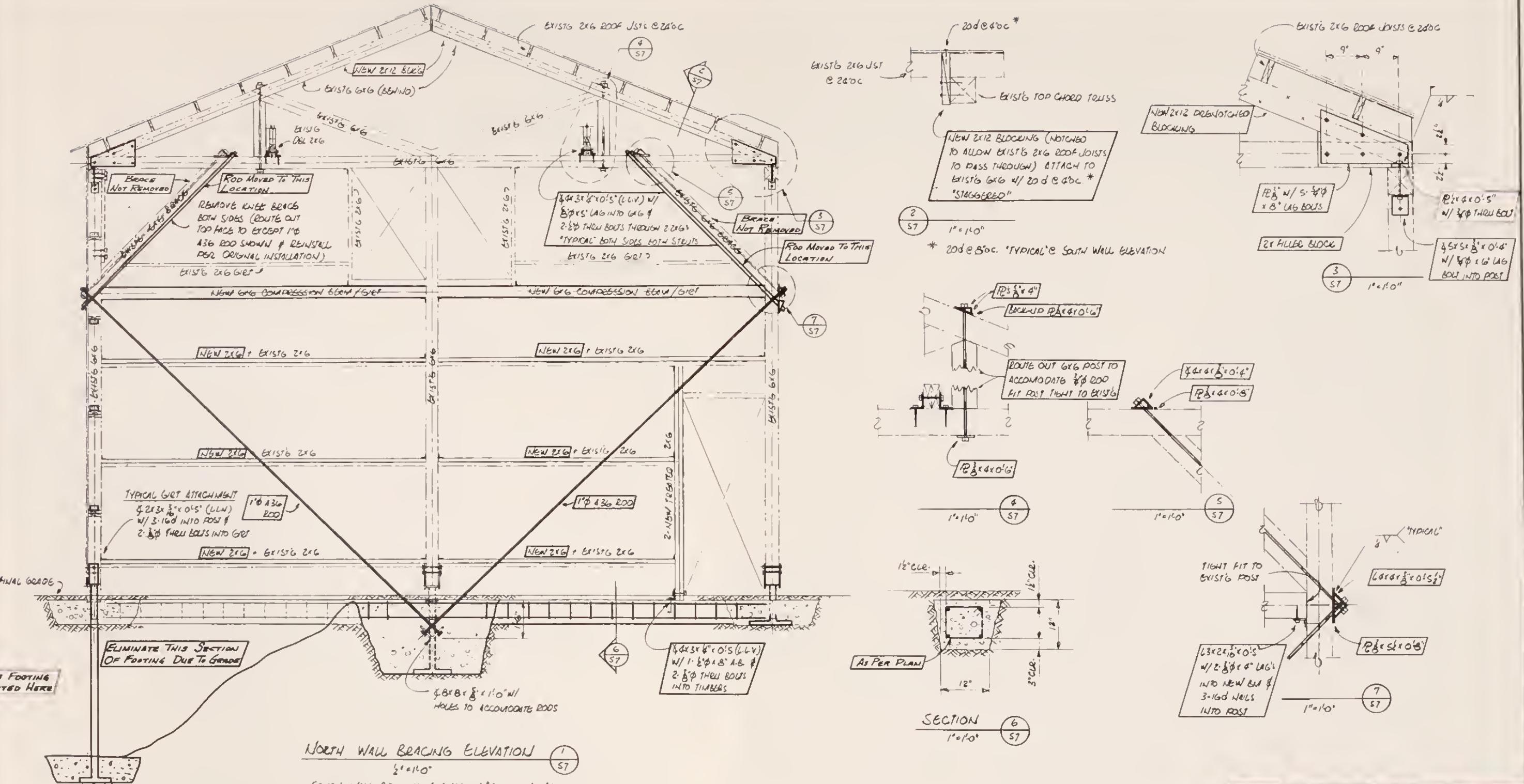


SITE PLAN AND GENERAL LAYOUT

**APEX MILL
BRACING ELEVATION & DETAILS
(INTERMEDIATE FRAME)**

STATE OF MONTANA																	
DEPARTMENT OF STATE LANDS																	
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION																	
 ASSOCIATED CONSTRUCTION ENGINEERING INC. AND CTA ARCHITECTS ENGINEERS																	
<table border="1"> <tr> <td>DATE</td> <td>MARCH 1991</td> </tr> <tr> <td>DRAWN BY</td> <td></td> </tr> <tr> <td>APPROVED BY</td> <td></td> </tr> <tr> <td>REVISION NUMBER</td> <td></td> </tr> <tr> <td>REVISED DATE</td> <td></td> </tr> <tr> <td>I</td> <td>6/20/91</td> </tr> <tr> <td colspan="2">As-Built 12-16-1991</td> </tr> <tr> <td colspan="2">SHEET NO. 64</td> </tr> </table>		DATE	MARCH 1991	DRAWN BY		APPROVED BY		REVISION NUMBER		REVISED DATE		I	6/20/91	As-Built 12-16-1991		SHEET NO. 64	
DATE	MARCH 1991																
DRAWN BY																	
APPROVED BY																	
REVISION NUMBER																	
REVISED DATE																	
I	6/20/91																
As-Built 12-16-1991																	
SHEET NO. 64																	
BILLINGS,	MONTANA																



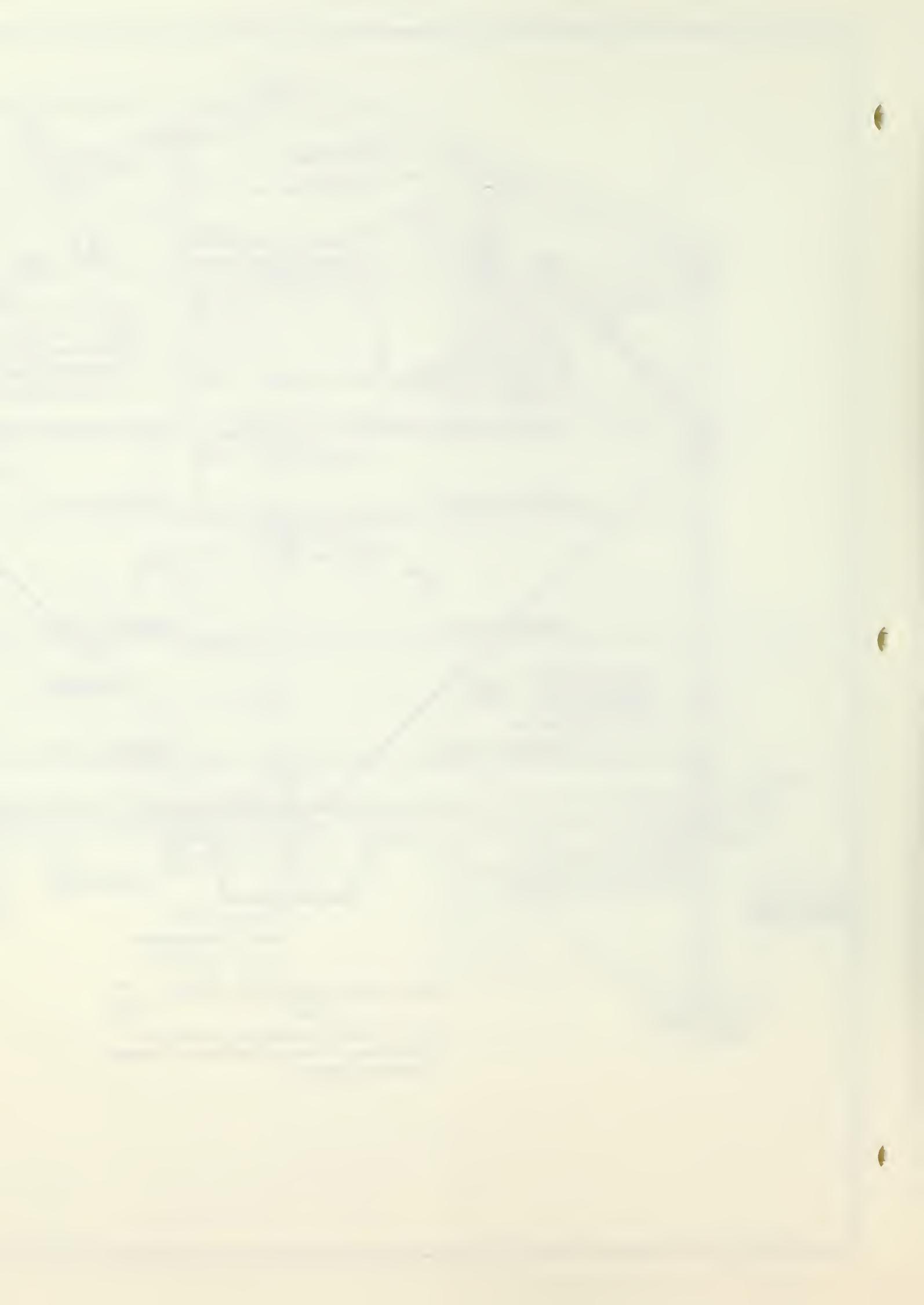


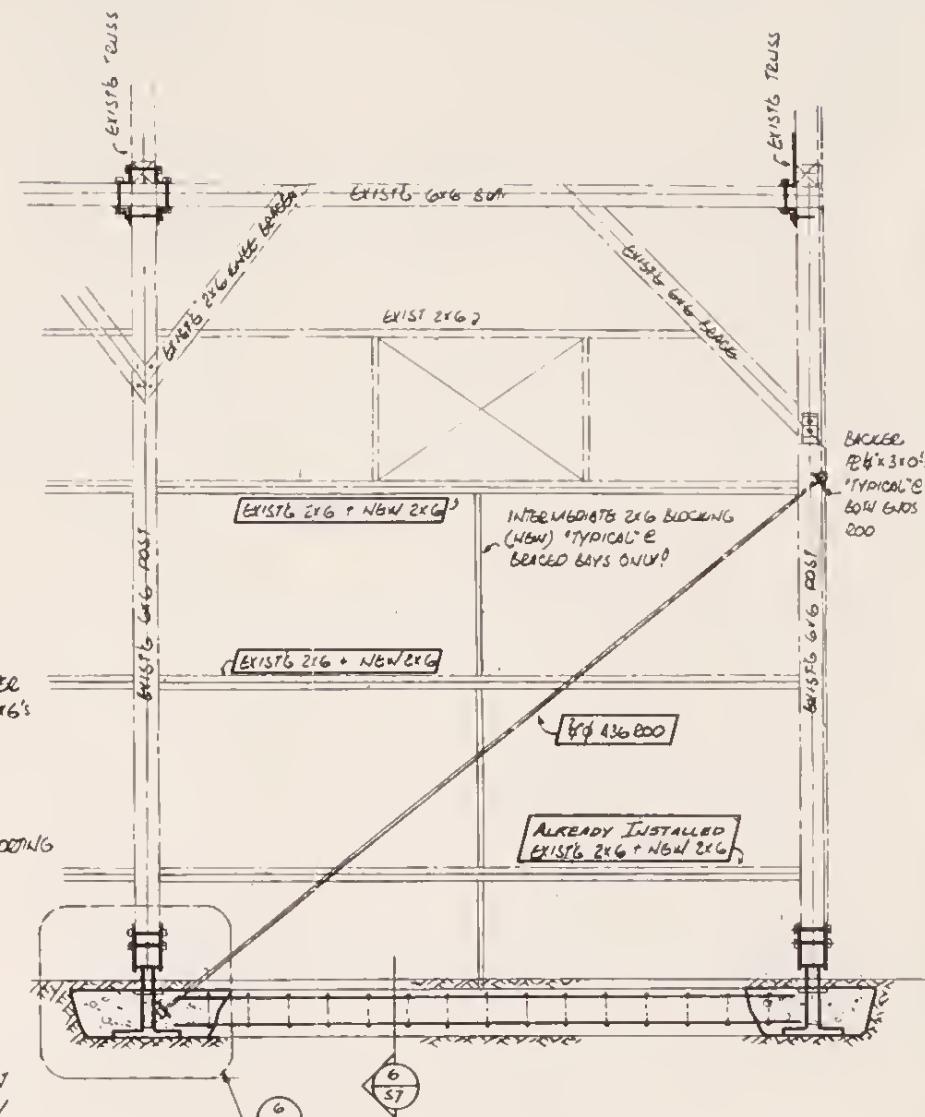
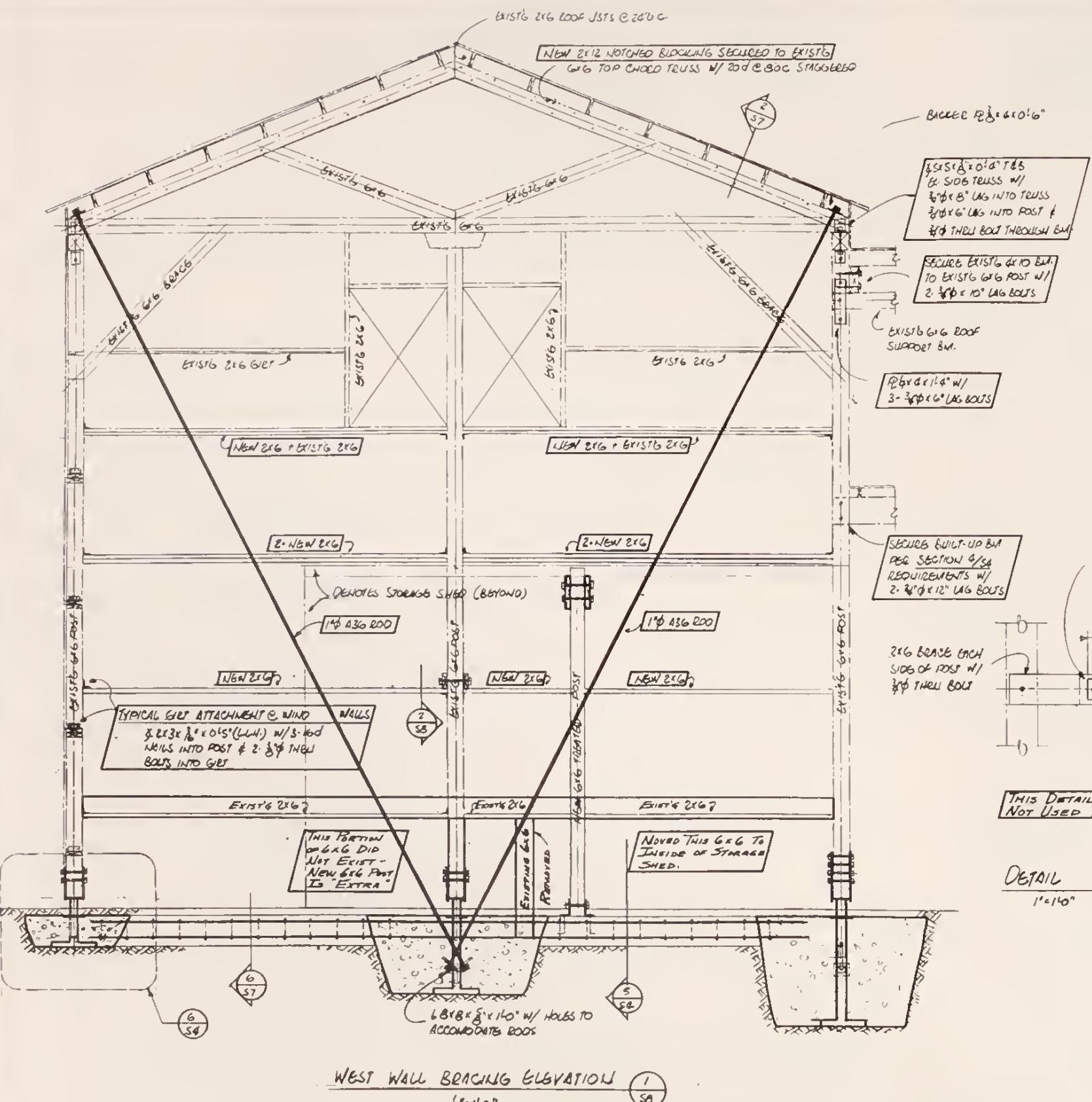
SITE PLAN AND GENERAL LAYOUT

APEX MILL
BRACING ELEVATION & DETAILS
(NORTH & SOUTH FRAME)

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

ASSOCIATED CONSTRUCTION
ENGINEERING INC.
AND
CTA ARCHITECTS ENGINEERS
BILLINGS, MONTANA





EAST WALL BRACING ELEVATION: (SOUTH END)

*2-10**
NORTH END "SIMILAR". REFER TO SECTION 1/55
OR DRAFT 2/55 FOR DIFFERENCES

SITE PLAN AND GENERAL LAYOUT

**APPEX MILL
BRACING ELEVATION & DETAILS
(EAST & WEST FRAME)**

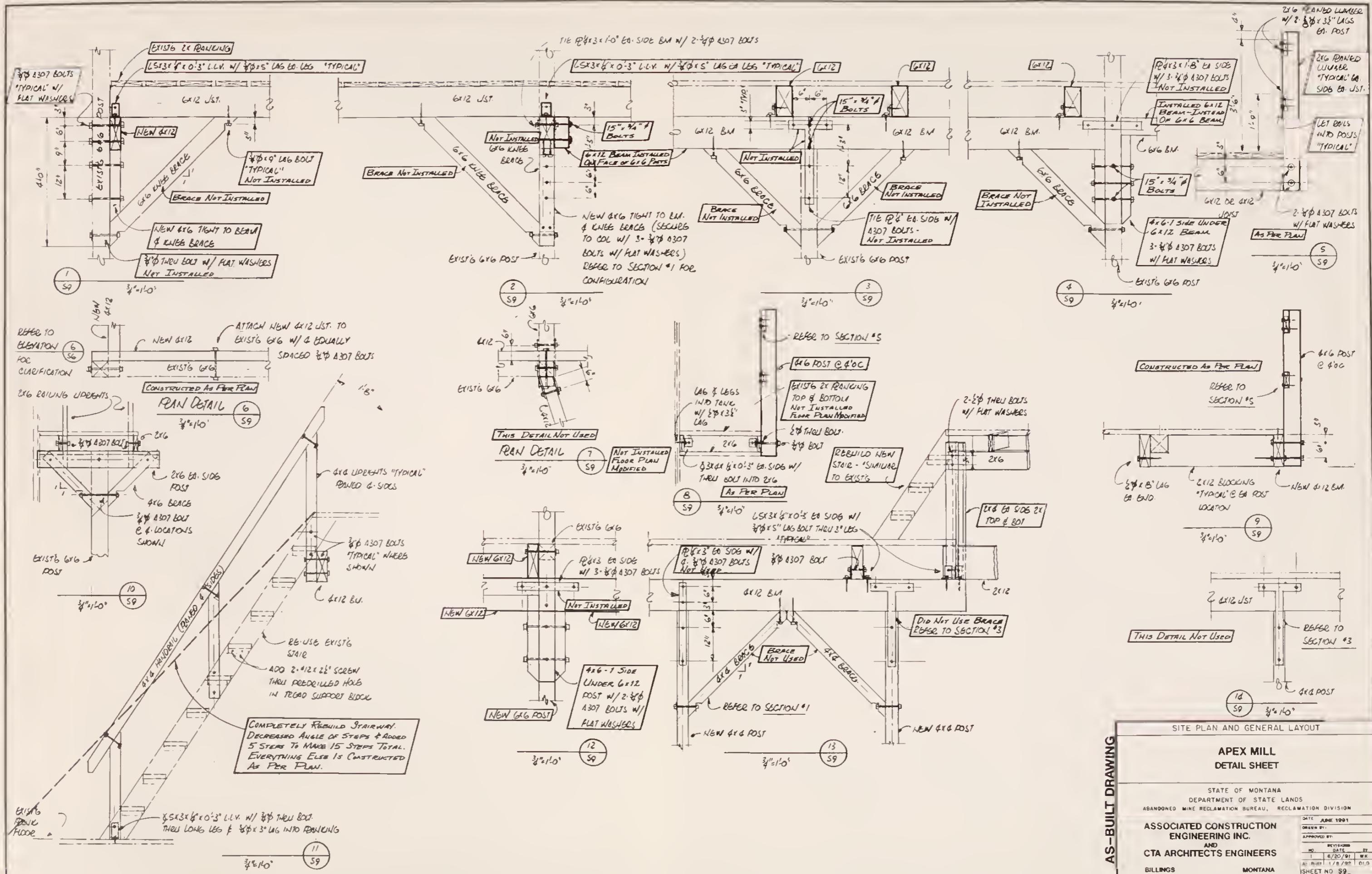
STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

**ASSOCIATED CONSTRUCTION
ENGINEERING INC.
AND
CTA ARCHITECTS ENGINEERS**

MONTANA

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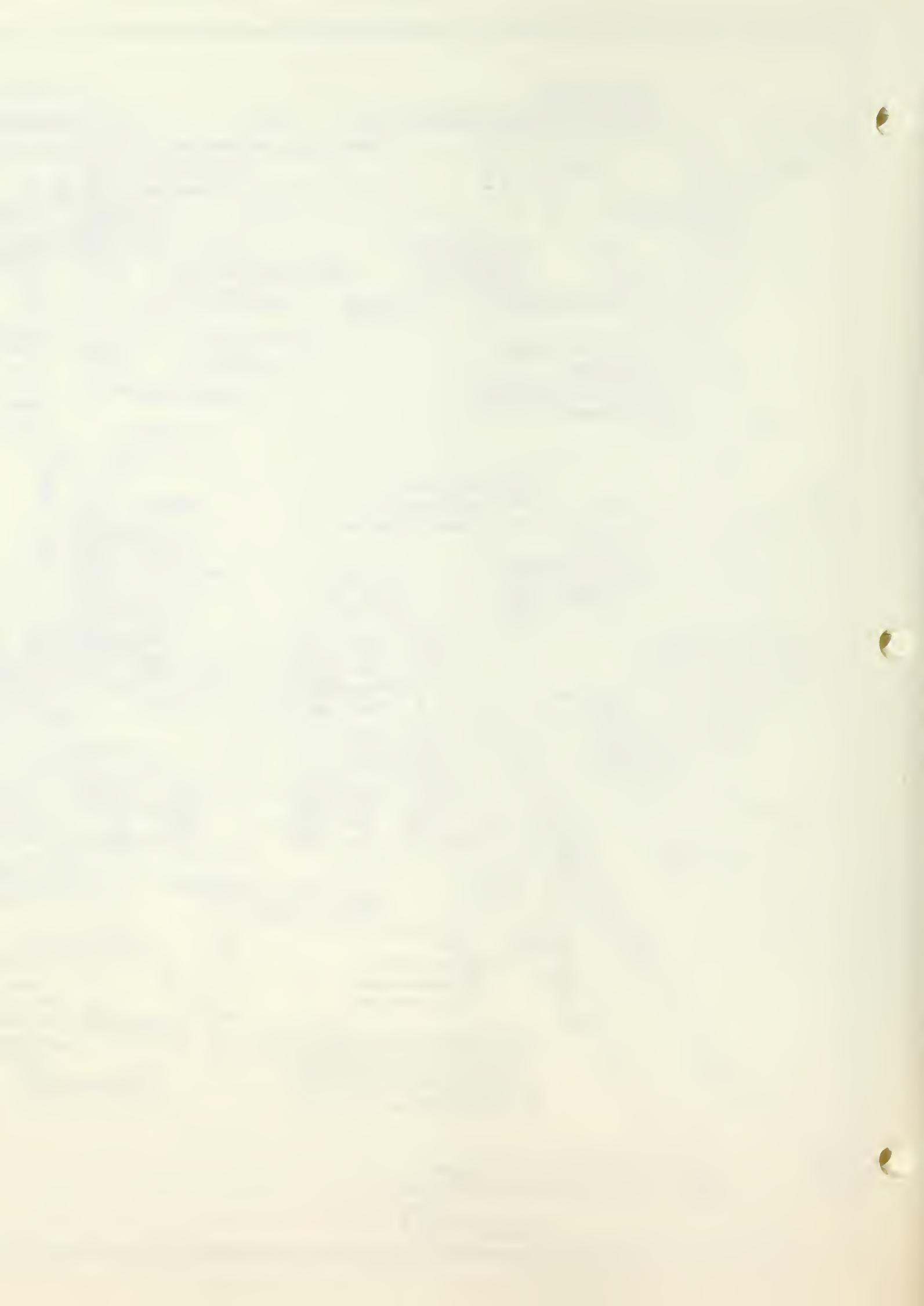


AS-BUILT DRAWING

APEX MILL DETAIL SHEET

STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
DATE: JUNE 1991
DRAWN BY:
APPROVED BY:
EDITION DATE: 1/6/92 WK
1/6/92 010
AS-BUILT 1/8/92 010
SHEET NO. 59

MONTANA



ATTACHMENT 7

PHOTOGRAPHS/SLIDES

PHOTO/SLIDE DESCRIPTIONS

PHOTO INDEX MAPS

PHOTOS/SLIDES



**BANNACK STATE PARK PROJECT
PHOTO & SLIDE DESCRIPTIONS**

<u>ASSIGNED NUMBER</u>	<u>DATE TAKEN</u>	<u>SUBJECT OR COMMENTS</u>
------------------------	-------------------	----------------------------

EQUIPMENT USED ON PROJECT

- | | | |
|---|----------|-------------------------------|
| 1 | 08-23-91 | Case backhoe 580-D |
| 2 | 08-23-91 | Ingersoll Rand air compressor |
| 3 | 08-23-91 | Diesel fuel tank |
| 4 | 08-23-91 | Water tank - 300 gallon |
| 5 | 08-23-91 | Cat D-7 track dozer |
| 6 | 10-16-91 | Case 275 tractor 4x4 |

TAILINGS POND

- | | | |
|----|----------|---|
| 7 | 08-23-91 | Pre-construction - N.E. tailings pond |
| 8 | 08-24-91 | Excavating burial pit in N.E. tailings pond with Cat D-7 |
| 9 | 09-27-91 | N.E. tailings pond after Cat D-7 work is complete looking west |
| 10 | 09-27-91 | N.E. tailings pond after Cat D-7 work is complete looking northeast |
| 11 | 10-16-91 | N.E. tailings pond after all work is complete looking west |
| 12 | 09-23-91 | Pre-construction view of lower tailings pond looking northeast |
| 13 | 09-23-91 | Pre-construction view of lower tailings berm looking northeast |
| 14 | 09-23-91 | Starting construction of lower tailings berm |
| 15 | 09-24-91 | Lower tailings pond complete looking west |
| 16 | 09-24-91 | Lower tailings pond complete looking east |
| 17 | 10-16-91 | Lower tailings pond complete looking west |
| 18 | 09-23-91 | Pre-construction of bench area looking north |
| 19 | 09-23-91 | Pre-construction of bench area berm looking west |
| 20 | 09-23-91 | Pre-construction close-up view of bench area piping |
| 21 | 10-04-91 | Excavating piping on bench area looking south |
| 22 | 10-04-91 | Bench area piping excavation complete looking south-southeast |
| 23 | 09-23-91 | Pre-construction of N.W. corner N.W. tailings pond |



**BANNACK STATE PARK PROJECT
PHOTO & SLIDE DESCRIPTIONS**

<u>ASSIGNED NUMBER</u>	<u>DATE TAKEN</u>	<u>SUBJECT OR COMMENTS</u>
24	09-23-91	Pre-construction of N.W. tailings pond looking southwest
25	09-24-91	D-7 Cat pushing material to N.W. corner of N.W. tailings pond
26	09-24-91	N.W. tailings pond after rough grading completed looking west
27	09-24-91	Dressing N.W. pond with pickup and drag bar looking west
28	10-16-91	N.W. tailings pond complete looking west
29	09-23-91	Pre-construction piping area - mid tailings looking north
30	09-23-91	Pre-construction piping area - mid tailings looking northeast
31	09-24-91	Building berm on mid tailings pond with D-7 looking north
32	09-24-91	Building berm on mid tailings pond with D-7 looking northwest
33	09-24-91	Finishing mid tailings pond looking west
34	09-24-91	Re-dressing mid tailings pond looking west
35	10-16-91	Sagebrush planted on mid tailings berm looking west
36	10-16-91	Sagebrush planted on mid tailings berm looking west
37	10-16-91	Mid tailings complete looking west
38	09-24-91	Pre-construction view of upper swale area looking south
39	09-24-91	Pre-construction view of upper swale area looking north
40	09-24-91	Pre-construction view of lower swale area looking south
41	09-24-91	Pre-construction view of lower swale area looking north
42	09-24-91	Preliminary excavation of upper swale area looking south
43	09-24-91	Upper swale area complete looking south
44	09-24-91	Preliminary excavation lower swale area looking southwest
45	10-16-91	Lower swale area complete looking southwest



**BANNACK STATE PARK PROJECT
PHOTO & SLIDE DESCRIPTIONS**

<u>ASSIGNED NUMBER</u>	<u>DATE TAKEN</u>	<u>SUBJECT OR COMMENTS</u>
MILL BUILDING		
46	09-23-91	South corner Apex Mill building looking north
47	09-23-91	Panorama of Mill building and tailings looking west
48	09-23-91	Panorama of Mill building and N.E. tailings looking northwest
49	09-24-91	Pre-construction of main building S.W. corner looking northeast
50	09-24-91	Pre-construction of main building east wall looking north
51	09-24-91	Pre-construction of main building north wall looking west
52	09-24-91	Digging footings for N.E. corner of building
53	09-24-91	Installing stand pipe and brackets on 6x6 pad on east wall
54	09-30-91	Rebar for footings for east wall looking south
55	09-30-91	Clearing access to east side of building looking south
56	10-01-91	Pouring concrete south wall looking west
57	09-30-91	Bracket placement mid-point east wall looking southeast
58	10-01-91	Pouring concrete N.E. corner of east wall looking north-northeast
59	10-01-91	Footings poured S.E. corner of east-south wall looking northwest
60	10-01-91	Footings poured for doorway along east wall looking west
61	10-01-91	Footings poured mid-point east wall looking southwest
62	10-03-91	Footings poured N.E. corner looking southwest
63	10-03-91	Footings north wall mid-point looking southwest
64	10-03-91	Mid footings north wall
65	10-03-91	Digging footings around maintenance room looking southeast
66	10-03-91	Digging footings around maintenance room looking southeast
67	10-03-91	Installing new studs and plates - maintenance room looking northeast
68	10-03-91	Installing new studs and plates - boiler room looking southeast



**BANNACK STATE PARK PROJECT
PHOTO & SLIDE DESCRIPTIONS**

<u>ASSIGNED NUMBER</u>	<u>DATE TAKEN</u>	<u>SUBJECT OR COMMENTS</u>
69	10-15-91	Boiler & maintenance room foundation complete looking northeast
70	09-24-91	Pre-construction view of tank number 3 base looking east
71	09-25-91	Jacking up tank number 3 looking northeast
72	09-25-91	Installing 8x8 posts under tank #3 looking northeast
73	10-15-91	Post-construction view of tank #3 looking east-southeast
74	10-15-91	Installing 6x12 joists upper floor
75	10-15-91	Bolting 6x12's in place looking west
76	10-15-91	All 6x12's in place looking west
77	10-15-91	Re-nailing floor to 6X12 joists looking west
78	10-15-91	Re-nailing floor using old and new planking looking west
79	10-16-91	Installing joists around tank number seven
80	10-16-91	Installing 6 inch lag screws in braces
81	10-16-91	Installing 4x4 and 6x6 under joists for upper floor
82	10-16-91	Tension rods mid-section and bottom of newly completed upper floor
83	10-17-91	Installing more flooring upper floor area looking southwest
84	10-17-91	Installing lagging upper floor looking northwest
85	10-17-91	Last boards installed upper floor looking west
86	10-17-91	Upper floor complete
87	10-17-91	Bottom of upper floor
88	10-17-91	Railing north side upper level floor looking north
89	10-17-91	Railing east side upper level and new 2x6 roof braces in background
90	10-17-91	Railing north side upper level looking north
91	10-17-91	N.E. corner of upper level railing looking northeast
92	10-17-91	Close-up of railing construction looking southwest
93	10-17-91	New 6x6 supports upper level looking southwest

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**BANNACK STATE PARK PROJECT
PHOTO & SLIDE DESCRIPTIONS**

<u>ASSIGNED NUMBER</u>	<u>DATE TAKEN</u>	<u>SUBJECT OR COMMENTS</u>
94	10-17-91	Upper level complete looking north
95	10-17-91	Upper level floor looking southwest
96	10-17-91	North railing upper level and new 2x10 braces under roof looking north
97	10-15-91	West wall (boiler room) before new 2x4's
98	10-15-91	West wall (boiler room) after installing 2x4's looking west
99	10-15-91	West wall (boiler room) after installing 2x4's looking west
100	10-15-91	New 6x6 post next to boiler room looking west
101	10-15-91	Installing 2x10 supports under loading dock roof looking west
102	10-15-91	Installing 2x10 ledges west wall loading dock
103	10-15-91	Jacking 2x10 ledges west wall loading dock looking southwest
104	10-15-91	New 6x6 supports at intermediate bracing and new 2x4's on north storage room wall looking southwest
105	10-15-91	Installing built up 2x4 post on north wall - maintenance room
106	10-15-91	Cutting and realigning N-S brace
107	10-15-91	Installing 2x12 on each side of 2x6 brace under loading dock
108	10-15-91	New 2x4 on north wall of storage area & new 2x12 on center of loading dock roof looking south-southwest
109	10-15-91	Reinforced wall on storage & boiler room, beams in loading dock area
110	10-15-91	Loading dock area complete looking south
111	10-15-91	Maintenance room right brace installed
112	10-15-91	Maintenance room left brace installed
113	10-15-91	Storage room - south wall complete
114	10-15-91	Storage room - roof and wall complete
115	10-15-91	Mid-section bracing 6x6 posts
116	10-15-91	Construction of stairs to upper level looking west



BANNACK STATE PARK PROJECT
PHOTO & SLIDE DESCRIPTIONS

<u>ASSIGNED NUMBER</u>	<u>DATE TAKEN</u>	<u>SUBJECT OR COMMENTS</u>
117	10-15-91	Construction of stairs to upper level looking west
118	10-15-91	Construction of stairs to upper level looking west
119	10-15-91	Stairs to upper level complete looking west
120	10-15-91	Stairs to upper level complete looking east
121	10-18-91	Removing steps to loading dock level looking southeast
122	10-18-91	Installing new steps from dock level looking east
123	10-18-91	Installing new steps from dock level looking east
124	10-18-91	Stairs complete from dock level to tanks 6 & 7 looking southeast
125	10-18-91	Railings being installed upper level looking southeast
126	10-18-91	Railings being installed upper level looking south
127	10-18-91	Railings being installed from upper level to upper tank level looking south
128	10-18-91	Tension rods N.E. corner of building complete
129	10-18-91	Installing 6x6 compression beam north wall
130	10-18-91	2x10 placement north end of roof
131	10-18-91	1/2" angle plate right corner north wall
132	10-18-91	1/2" angle plate right corner north wall
133	10-18-91	Angle bracket, wind girts installed north wall (typical)
134	10-18-91	1/2" angle plate left corner north wall
135	10-18-91	Installing upper tension bolt right side south wall
136	10-18-91	1/2" angle plate and tension bar installed upper right corner south wall
137	10-18-91	1/2" angle plate and tension bar installed upper right corner south wall
138	10-18-91	Installing 6x6 compression beam south wall looking southeast
139	10-18-91	Installing 6x6 compression beam south wall looking south
140	10-18-91	Outside anchor for tension bolts - typical N & S walls
141	10-18-91	New 2x10's on existing 6x6 under roof

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**BANNACK STATE PARK PROJECT
PHOTO & SLIDE DESCRIPTIONS**

<u>ASSIGNED NUMBER</u>	<u>DATE TAKEN</u>	<u>SUBJECT OR COMMENTS</u>
142	10-18-91	New 2x10's on existing 6x6 under roof
143	10-18-91	New 2x12 next to 2x6 under roof
144	10-18-91	1½ inch support rod being installed
145	10-18-91	1½ inch support rod being installed above upper walkway
146	10-18-91	1½ inch support rod complete
147	10-18-91	New truss installation main roof
148	10-18-91	Vertical tension bolt under roof (typical)
149	10-18-91	Vertical tension bolt west corner south wall
150	10-18-91	Tension bolt placed under brace east corner - north wall
151	10-18-91	Junction of tension bolts on west corner, north wall
152	10-18-91	New trusses under main roof (typical)
153	10-18-91	Portion of main roof and north wall - showing bracing
154	10-18-91	Jacking pipes from ball mill that cause wall to sag. Rebuilt wall
155	10-18-91	Installing new lags on all knee braces
156	10-18-91	New bracket on 6x6 post west of tank number 5 looking northeast
157	09-24-91	Pre-construction view of the collapsed shed over the bullion furnace looking to the southeast
158	11-05-91	Post-construction view of the shed after the roof has been reinstalled



PICTURE 1 IS A PANORAMA LOOKING NORTH SHOWING THE MILL TAILINGS, THE APEX MILL, AND THE STATE PARK ADIT

VEHICLE TRAVEL WILL BE LIMITED
TO ROUTES FLAGGED ON-SITE BY
THE PROJECT ENGINEER.

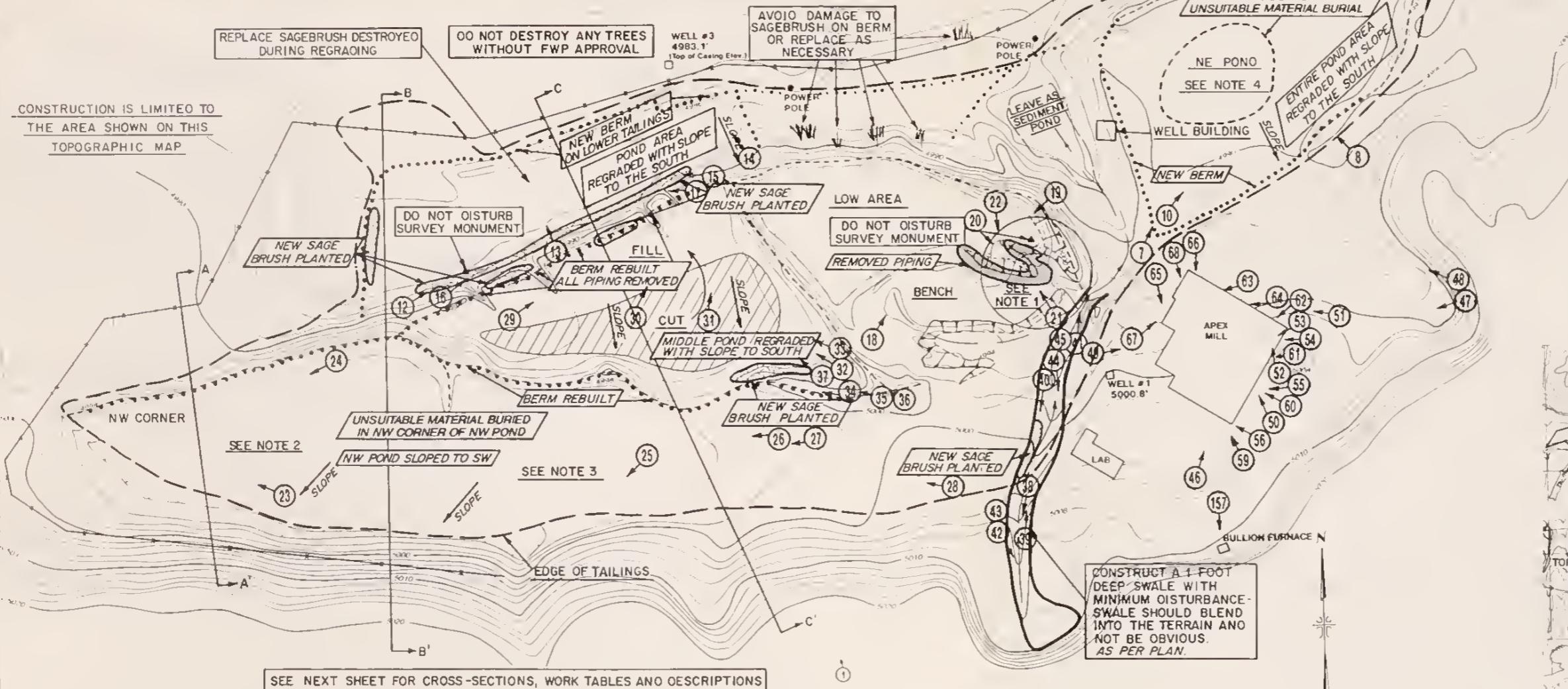
WELL #2
4980 1'
(Cement Collar Elev.)

PROPOSED WELL
TO BE INSTALLED
BY ENGINEER

PROPOSED WELL



PROJECT SITE STATE LOCATION MAP



BOUNDARY OF TAILINGS

CREST LINE OF EXISTING TAILINGS BERMS

CREST LINE OF TAILINGS - TO BE BUILT OR RECONSTRUCTED

NOTES

1. EXCAVATE AND REPLACE TO ELIMINATE PIPING, COMPACT WITH AT LEAST 3 PASSES OF WHEELED VEHICLE. (MUST BE MOIST.)

2. PUSH AND SPREAD THE NON-TAILINGS MATERIAL INTO THE NW CORNER. (MAXIMUM FILL ELEVATION IS 4993') COVER THE NON-TAILINGS MATERIAL WITH CUT FROM NOTE 3.

3. CUT TO COVER NOTE 2 MATERIAL.

4. UNSUITABLE MATERIALS WHICH HAVE BEEN SPREAD ON TOP OF THE TAILINGS IN THE NE POND WILL BE COLLECTED AND DEPOSITED IN AN EXCAVATED DISPOSAL PIT WITHIN THIS POND AREA. THE UNSUITABLE MATERIALS WILL BE COVERED WITH AT LEAST 1 FOOT OF SUITABLE MATERIAL FROM THE EXCAVATION. TWO FOOT HIGH CONTAINMENT BERMS WILL BE CONSTRUCTED IN THE INDICATED AREAS. THE IMPOUNDMENT AREA WITHIN THE BERMS WILL BE GRADED FLAT.

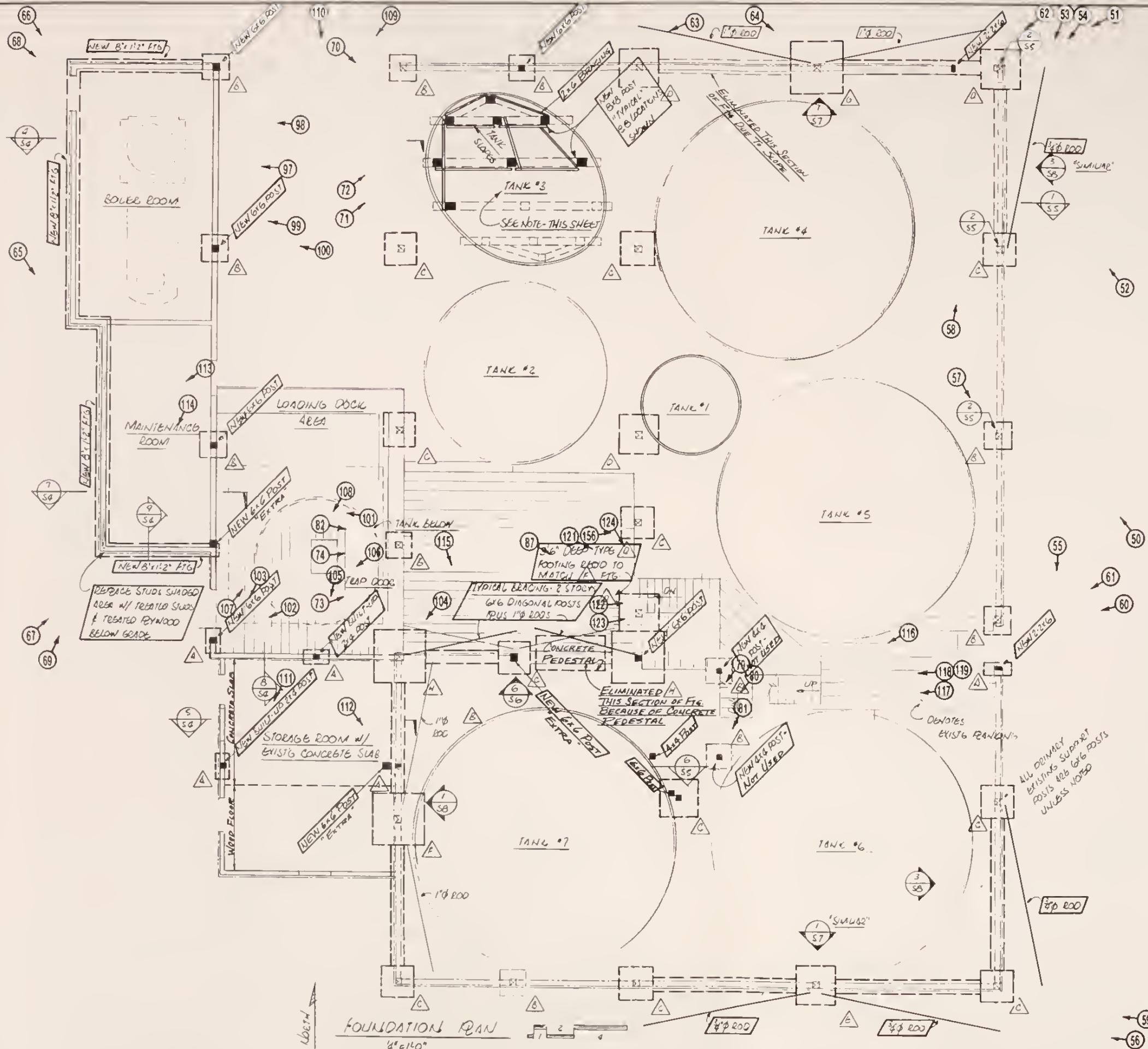
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LEGEND

E -> EXISTING CONSTRUCTION
 FOOTING TYPE - SEE SCHEDULE BELOW
 FOOTINGS OR SUPPORT BEAMS
 ES EACH SIDE
 Ø DIAMETER
 O.C. ON CENTER OR CENTER TO CENTER SPACING

TANK #3 - EXISTING POST & BRACING REPAIR PROCEDURE

- 1) JACK & SHORE TANK AS REQUIRED FOR REMOVAL OF EXISTING POSTS
- 2) REMOVE EXISTING ROTTED TIMBER POSTS & BRACING.
- 3) INSERT NEW PRESSURE TREATED 8x8 POSTS & 4' LONG
- 4) AT 8 SHADDO LOCATIONS NOTED.
- 5) POSTS ARE TO BEAR DIRECTLY ON THE EXISTING SUBSURFACE CONCRETE SLAB AT LOCATIONS OF EXISTING POSTS.
- 6) REMOVE JACKS & SHORING.
- 7) PROVIDE 2X6 DIAGONAL BRACE AT EACH NEW POST LOCATION POSITIONED SIMILAR TO EXISTING. (ESTIMATE 4 BEACES X 10' LONG)
- 8) TIGHTEN STEEL BANDS ON REDWOOD TANKS.

FOOTING SCHEDULE		
NAME	SIZE	REINFORCEMENT
A	1'-0" x 2'-0" x 1'-0"	NONE REQ'D
B	2'-0" x 2'-0" x 1'-0"	NONE REQ'D
C	2'-0" x 2'-0" x 1'-0"	NONE REQ'D
D	3'-0" x 3'-0" x 1'-0"	3-#6 60 WAY
E	3'-0" x 3'-0" x 2'-0"	NONE REQ'D
F	4'-0" x 4'-0" x 2'-0"	NONE 250'L
G	4'-0" x 4'-0" x 3'-0"	NONE 250'L
H	4'-0" x 4'-0" x 3'-0"	NONE REQ'D

DIMENSIONAL NOTES:

SCALE PLANS, SECTIONS, & DETAILS FOR QUANTITY TAKEOFFS.
ALL SCALED DRAWINGS TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION

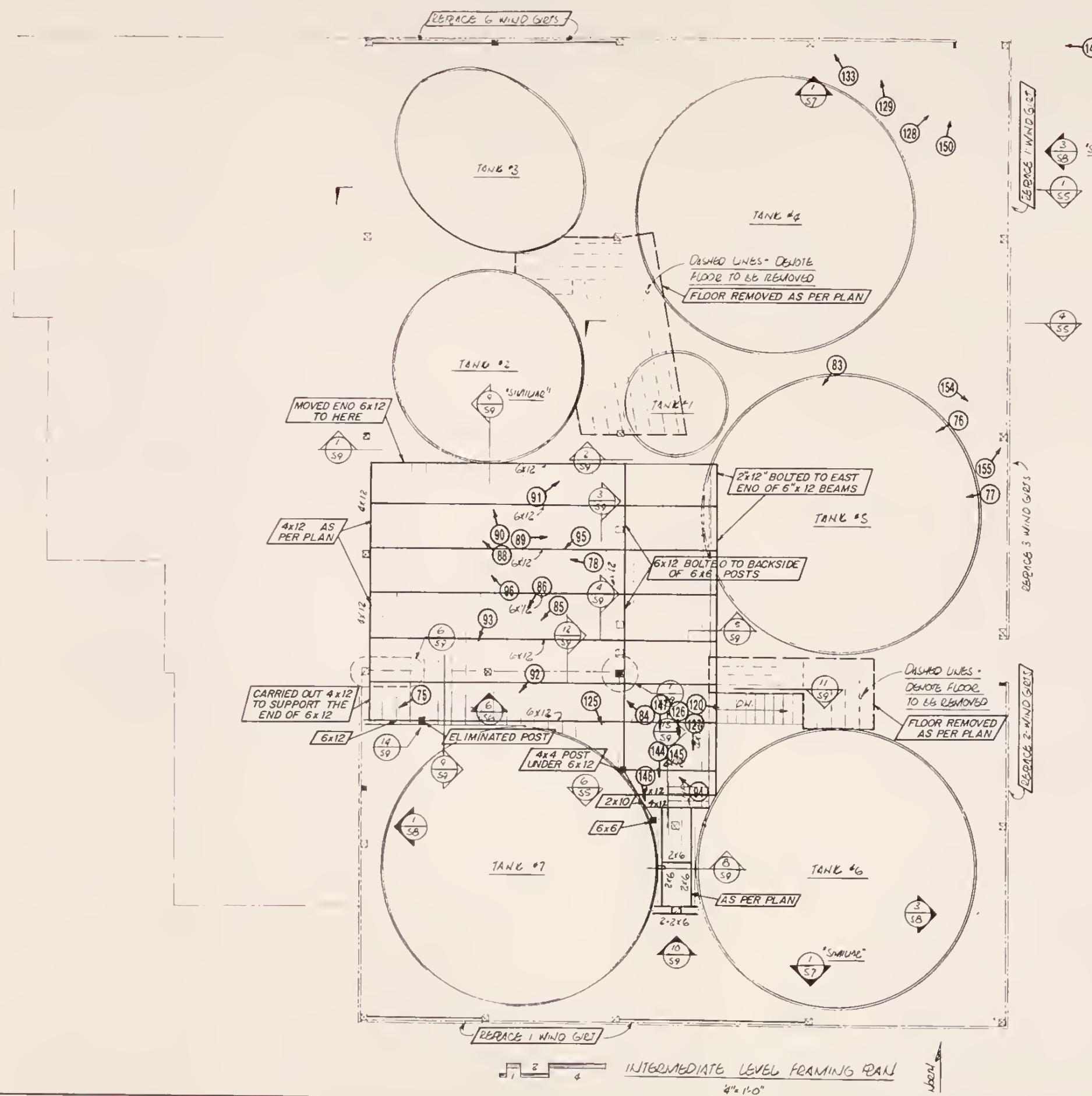
SITE PLAN AND GENERAL LAYOUT

APEX MILL-PHOTO INDEX FOUNDATION PLAN

STATE OF MONTANA
 DEPARTMENT OF STATE LANDS
 ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
 DATE: March 1991
 DRAWN BY:
 APPROVED BY:
 REVISIONS DATE BY
 1 6/20/91 WK
 2 6/20/91 DLD
 3 6/20/91 DLD
 BILLINGS, MONTANA
 SHEET NO. 51

AS-BUILT DRAWING





UPPER LEVEL FRAMING REPLACEMENT PROCEDURE

- 1.) REMOVE ALL EXISTING FRAMING - NUMBER AND JACKPILE FOR RE-USE.
- 2.) REMOVE EXISTING SUPERSTRUCTURE AS REQUIRED - BEAMS, COLUMNS, STAIRS, ETC THAT ARE SUPPORTING FLOOR ONLY AND STOCKPILE AS REQUIRED FOR LATER USE.
- 3.) LOCATE NEW SUPPORT COLUMN AT LOCATIONS SHOWN ON THE DRAWINGS. POUR FOOTINGS AT NEW POST LOCATIONS UTILIZING MODIFIED DETAIL 6/5-4 AT 4x4 POST LOCATIONS.
- 4.) ERECT NEW SUPERSTRUCTURES PER DETAIL REQUIREMENTS. USE #1 GRADE LODGEPOLE PINE OR DRYED ROUGH SAWN TIMBERS (RELATIVELY CLEAR OF KNOTS & CHECKS) FOR BEAMS, JOISTS, AND COLUMNS.
- 5.) INSTALL HANDRAILS AND STANDARDS USING RANGED KILN DRYED DOUGLAS FIR #2 OR BETTER.
- 6.) INSTALL STOCKPILED 2X FRAMING w/ 2-40D PINE BARN NAILS AT EACH SUPPORT. WHERE ORIGINAL FRAMING IS NOT SUITABLE, REPLACE WITH ANOTHER ORIGINAL FRAMING.
- 7.) MODIFY CONCRETE AND INSTALL STAIRS PER DETAIL REQUIREMENTS.

SITE PLAN AND GENERAL LAYOUT

APEX MILL-PHOTO INDEX INTERMEDIATE LEVEL FRAMING PLAN

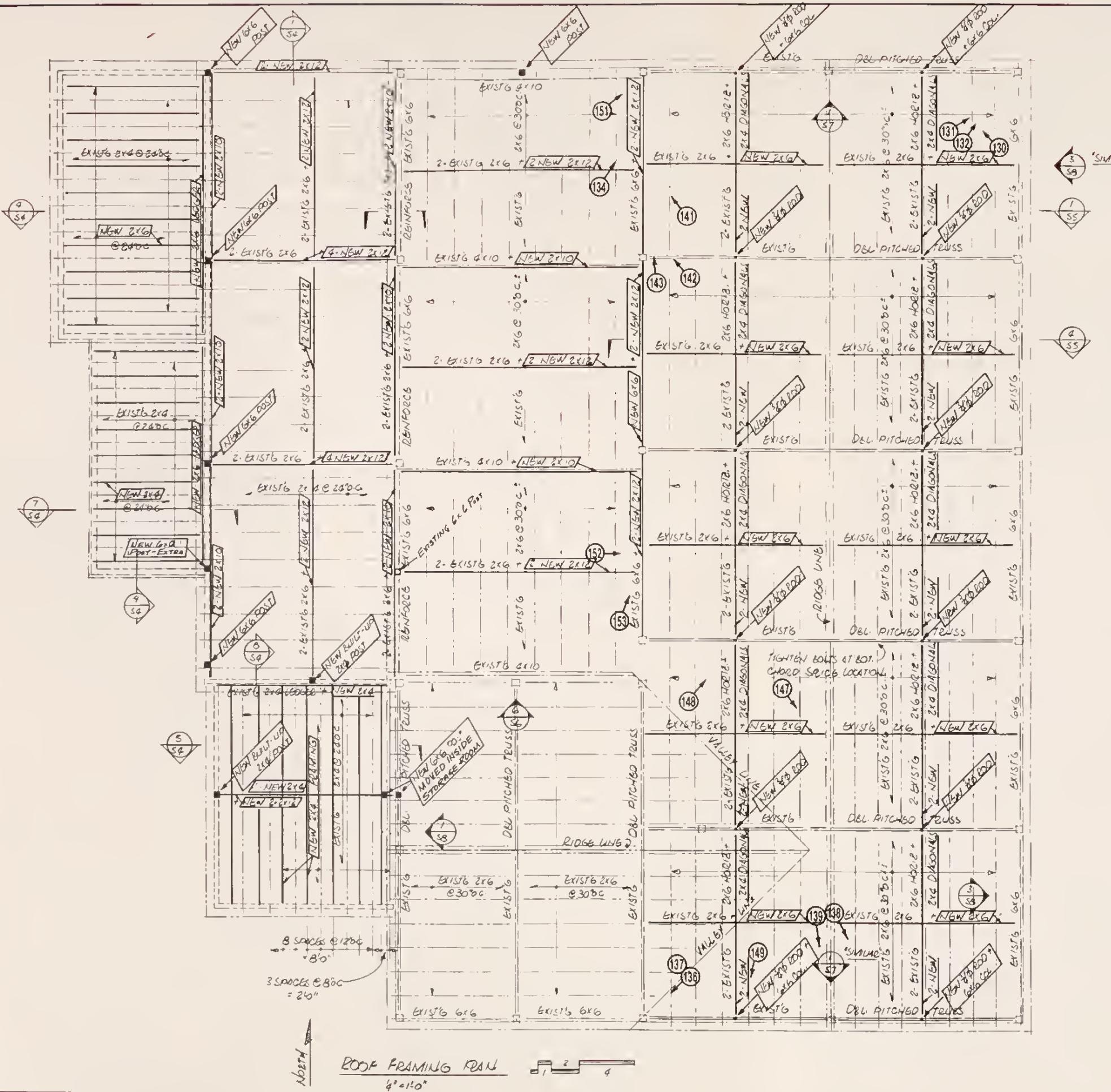
STATE OF MONTANA
DEPARTMENT OF STATE LANDS
ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION

ASSOCIATED CONSTRUCTION
ENGINEERING INC.
AND
CTA ARCHITECTS ENGINEERS

BILLINGS, MONTANA

DATE	March 1991
DRAWN BY:	
APPROVED BY:	
REVISIONS	
NO.	1
DATE	5/20/91
As-Built	WR
As-Built	12-17-1991
As-Built	DLG

SHEET NO. 52



AS-BUILT DRAWING

SITE PLAN AND GENERAL LAYOUT
APEX MILL-PHOTO INDEX

STATE OF MONTANA
 DEPARTMENT OF STATE LANDS
 ABANDONED MINE RECLAMATION BUREAU, RECLAMATION DIVISION
**ASSOCIATED CONSTRUCTION
ENGINEERING INC.**
 AND
CTA ARCHITECTS ENGINEERS
 BILLINGS, MONTANA

EQUIPMENT



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BANNACK STATE PARK
 QUAD: BANNACK, MT
 T8S, R11W, SEC. 7
 BEAVERHEAD COUNTY
 BANNACK STATE PARK
 PROJECT-AMRB NO.91-006

BEFORE, DURING AND
 AFTER CONSTRUCTION
 PHOTOS OF THE
 RECLAMATION WORK
 CONSTRUCTION PERIOD
 9/23/91-10/30/1991



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TAILINGS PONDS



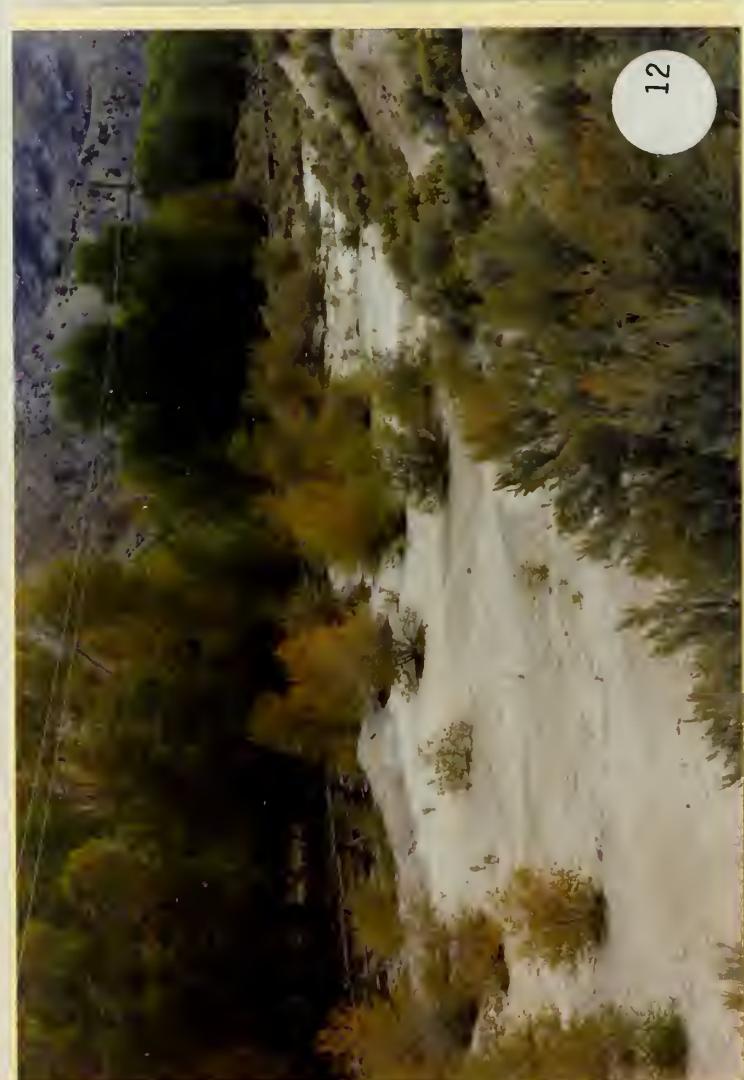
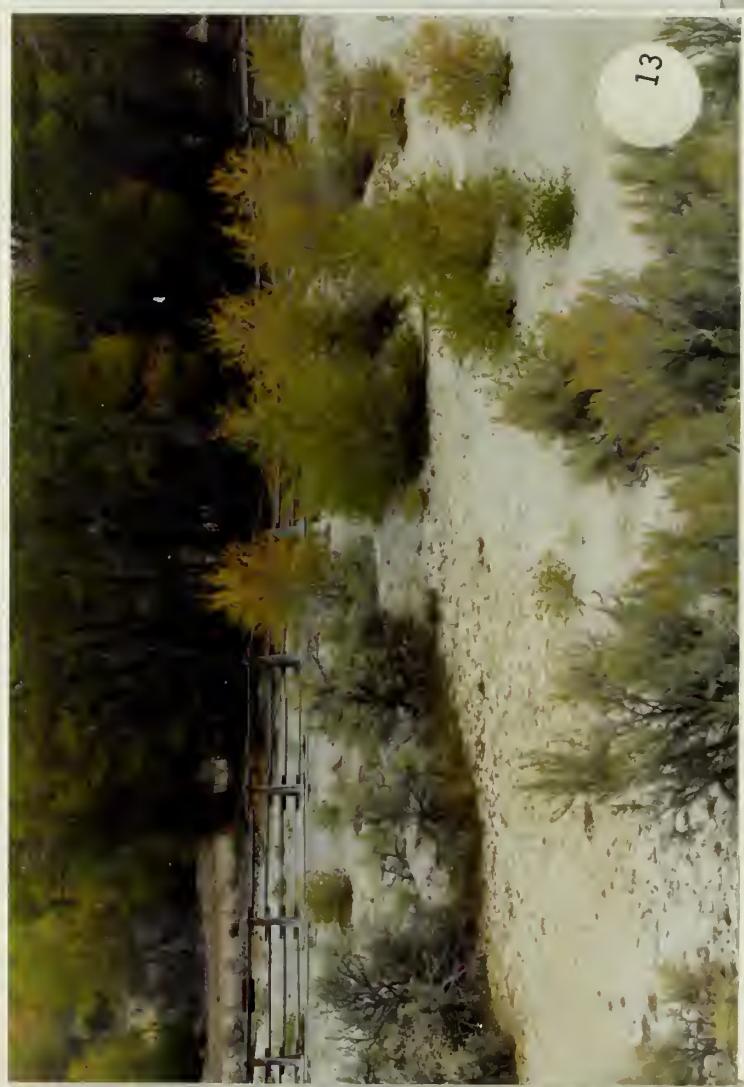
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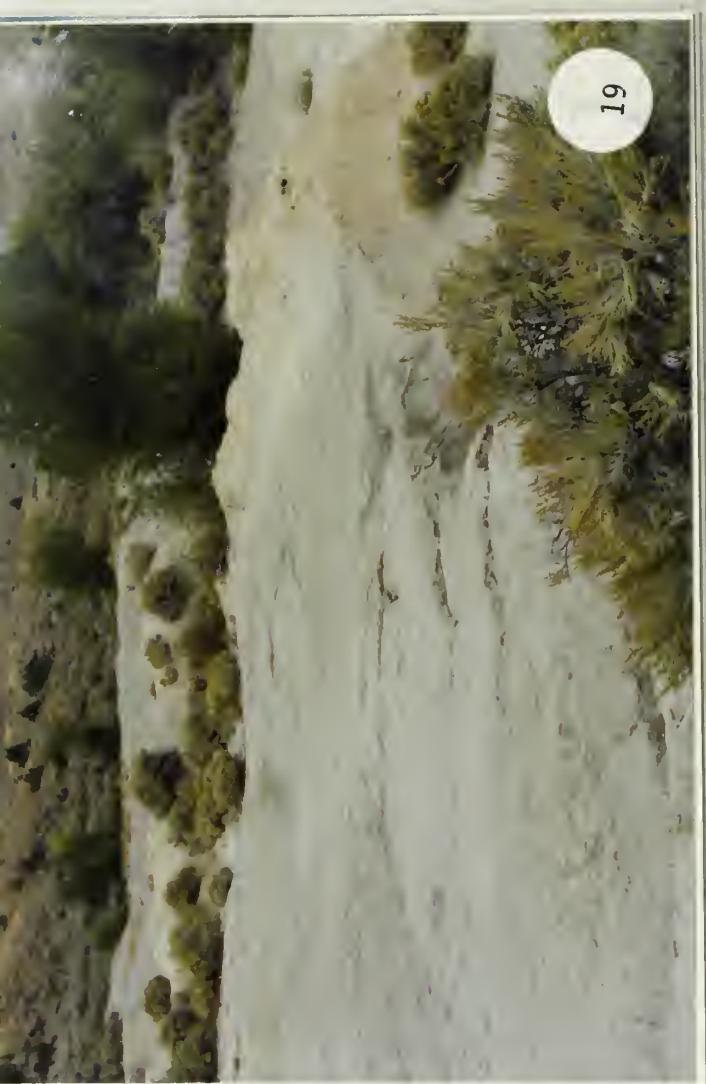
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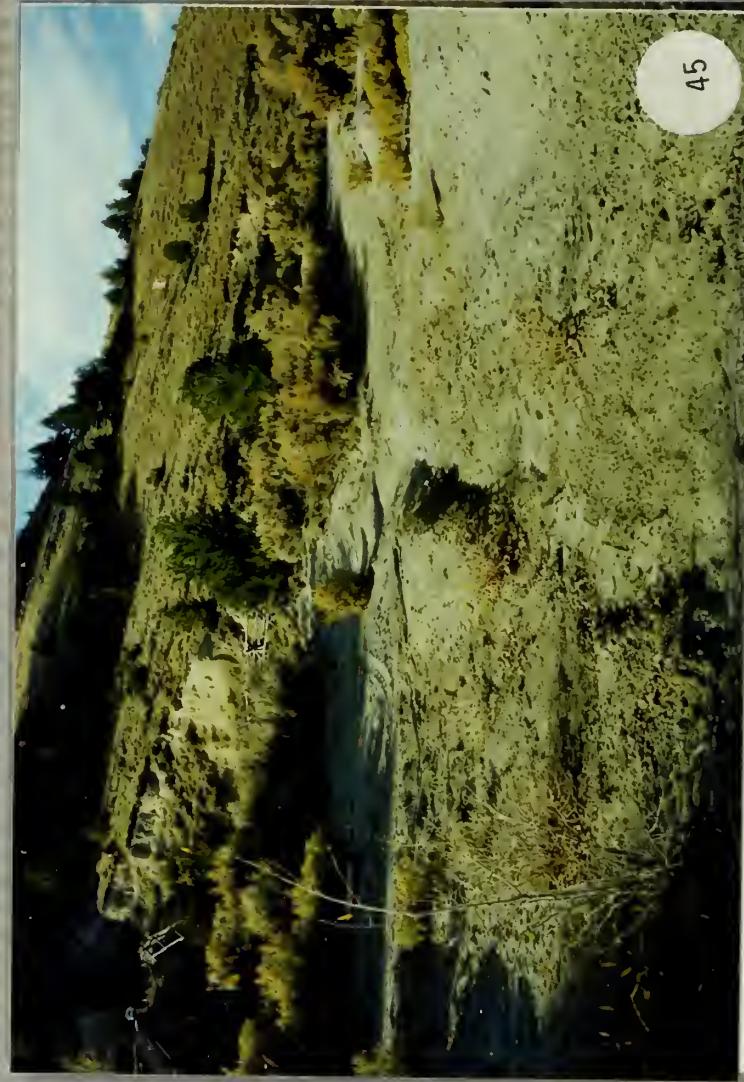
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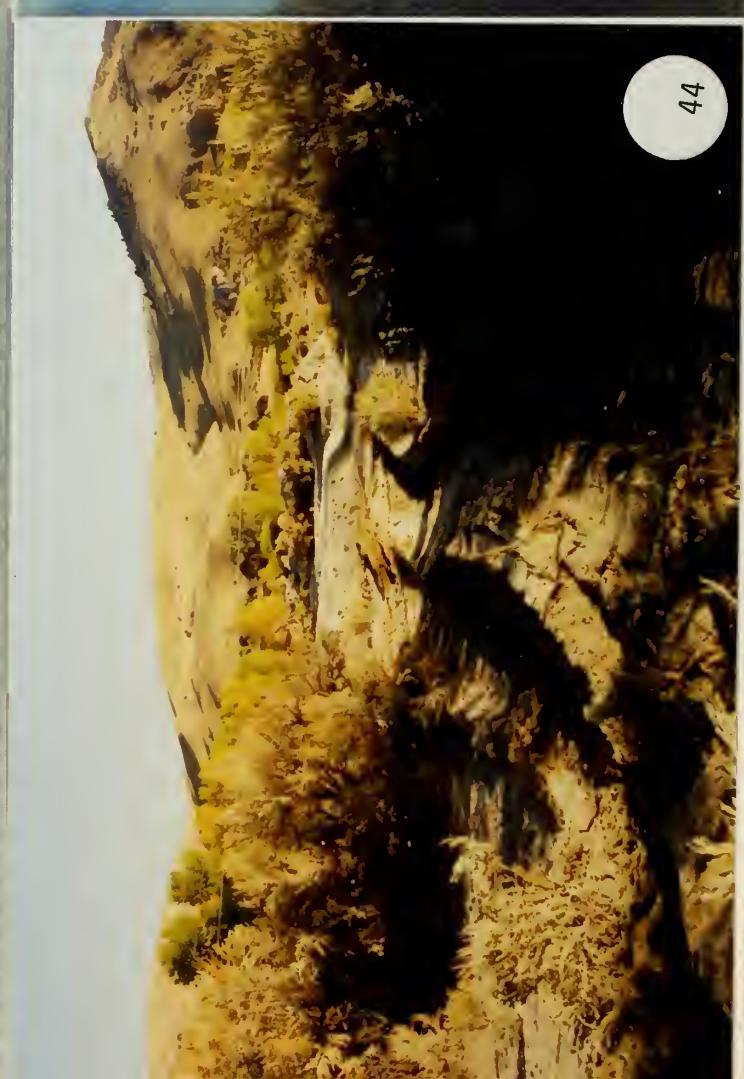
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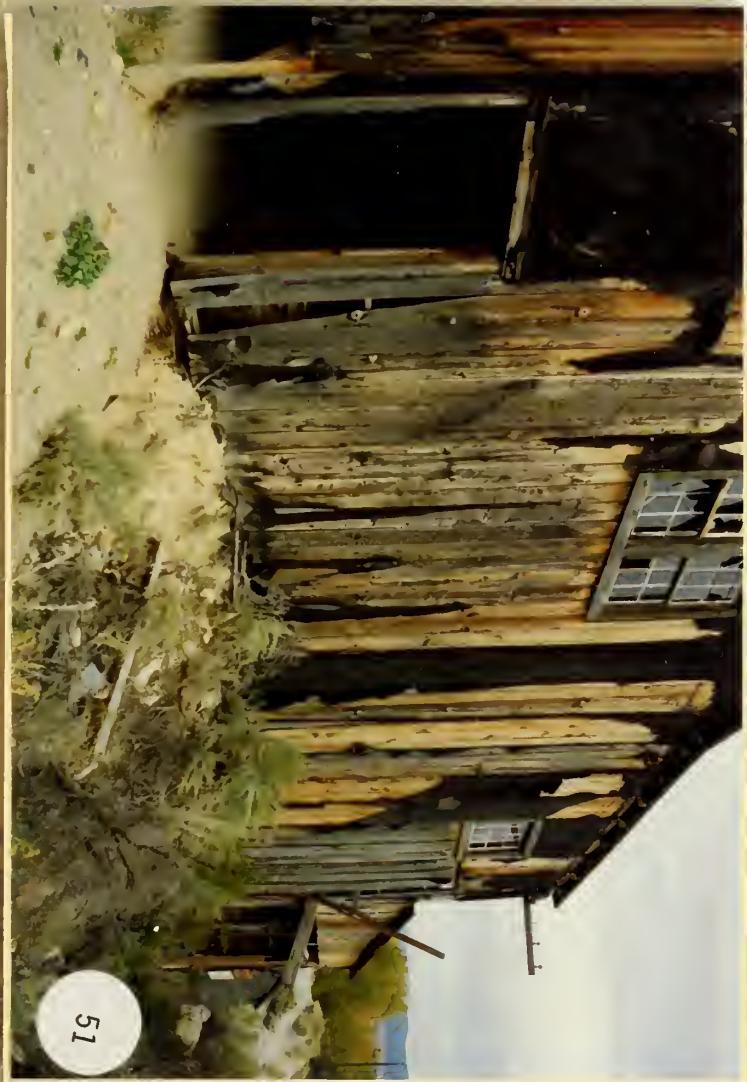
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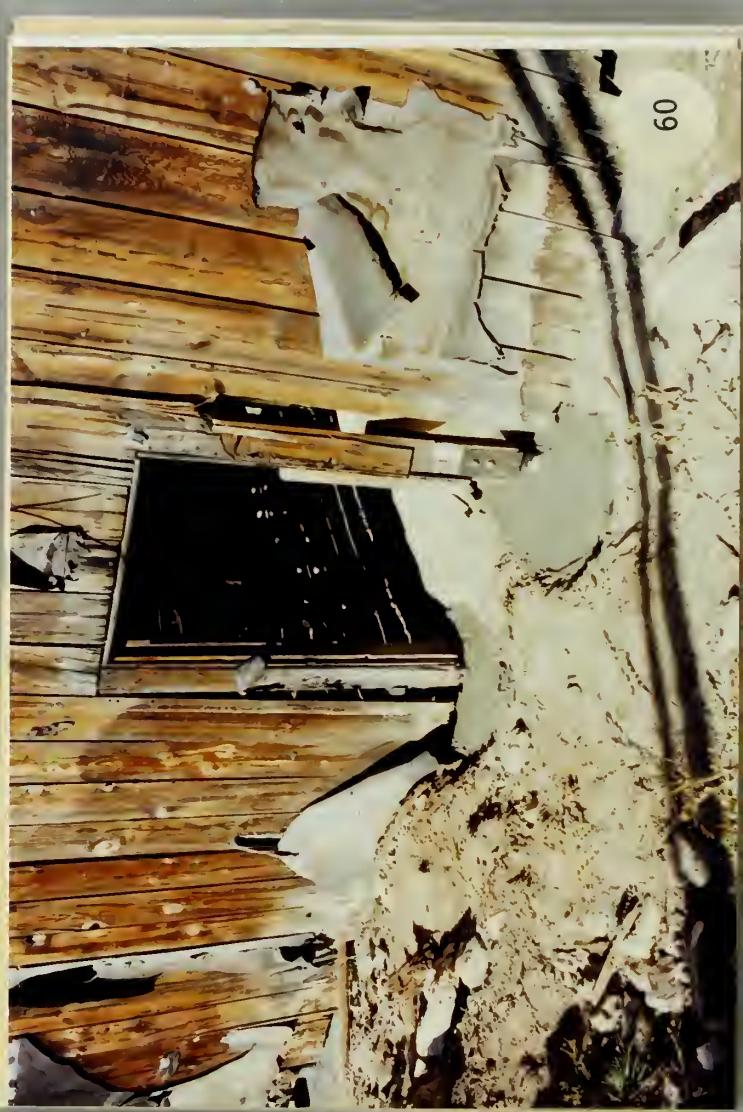




APEX MILL

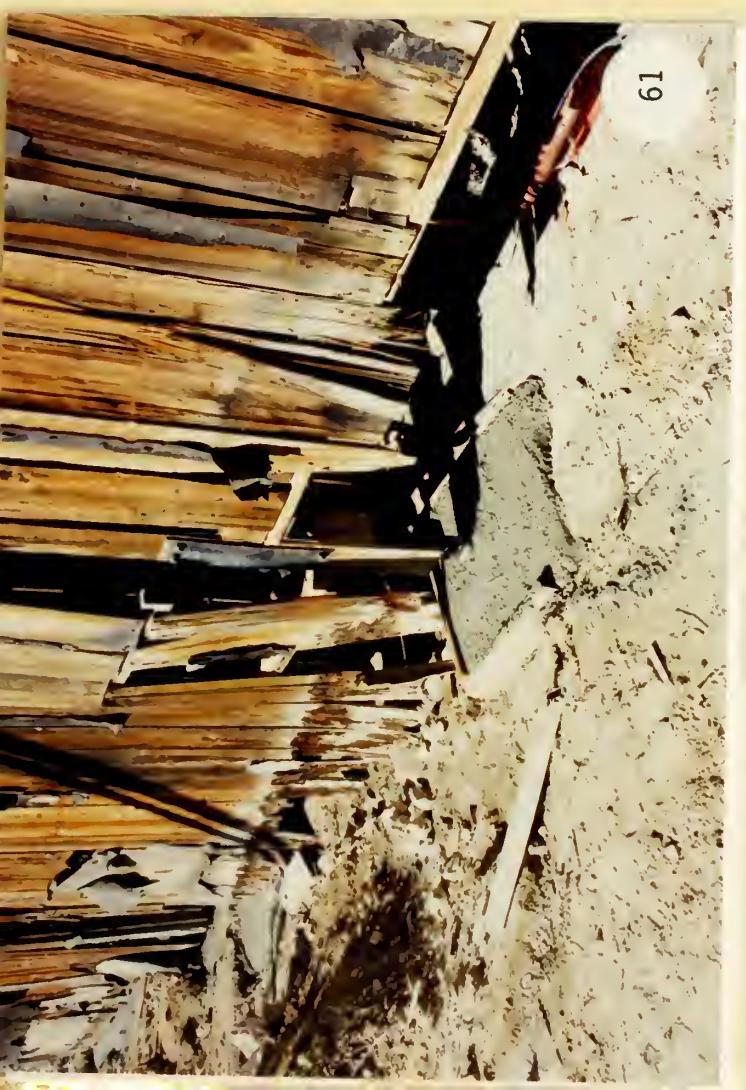








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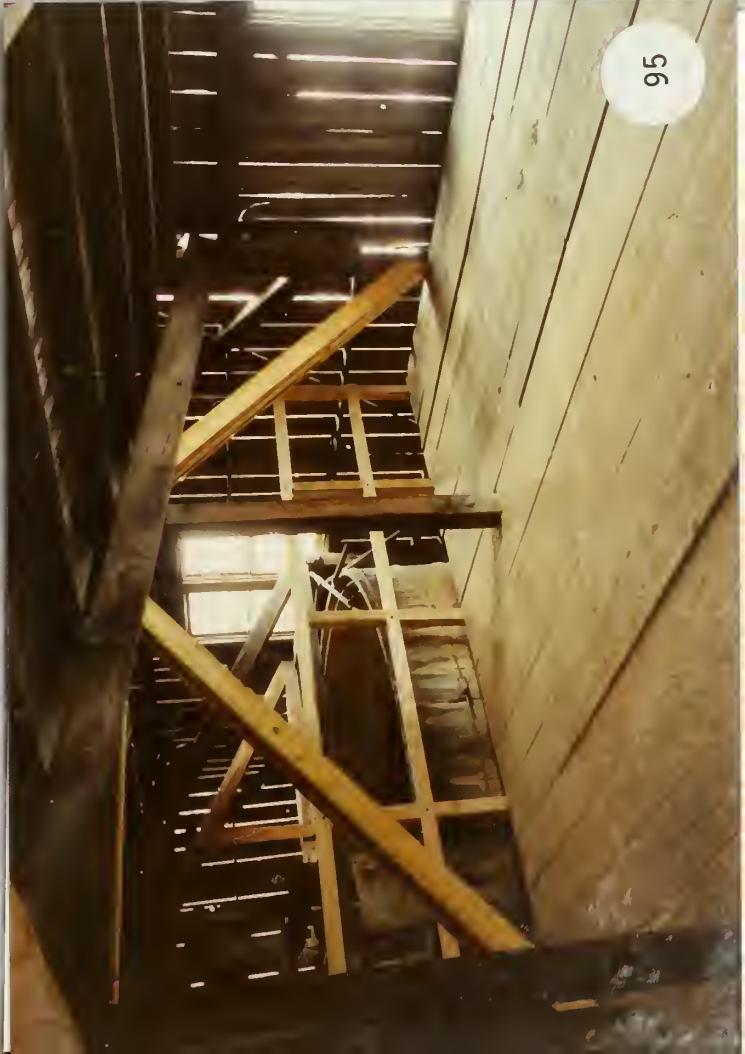
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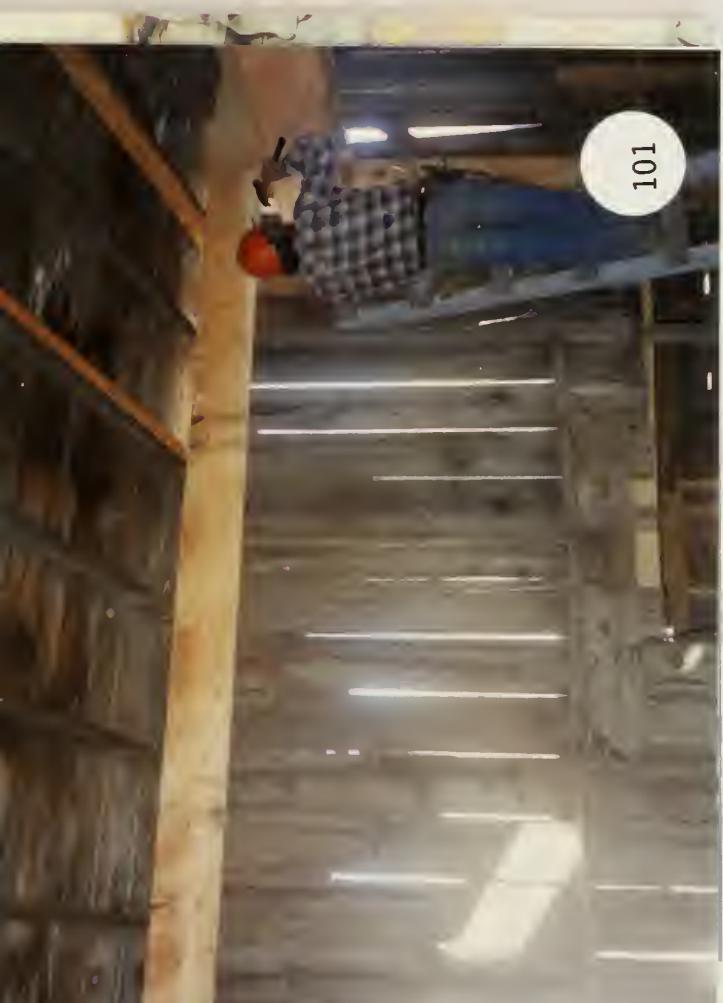


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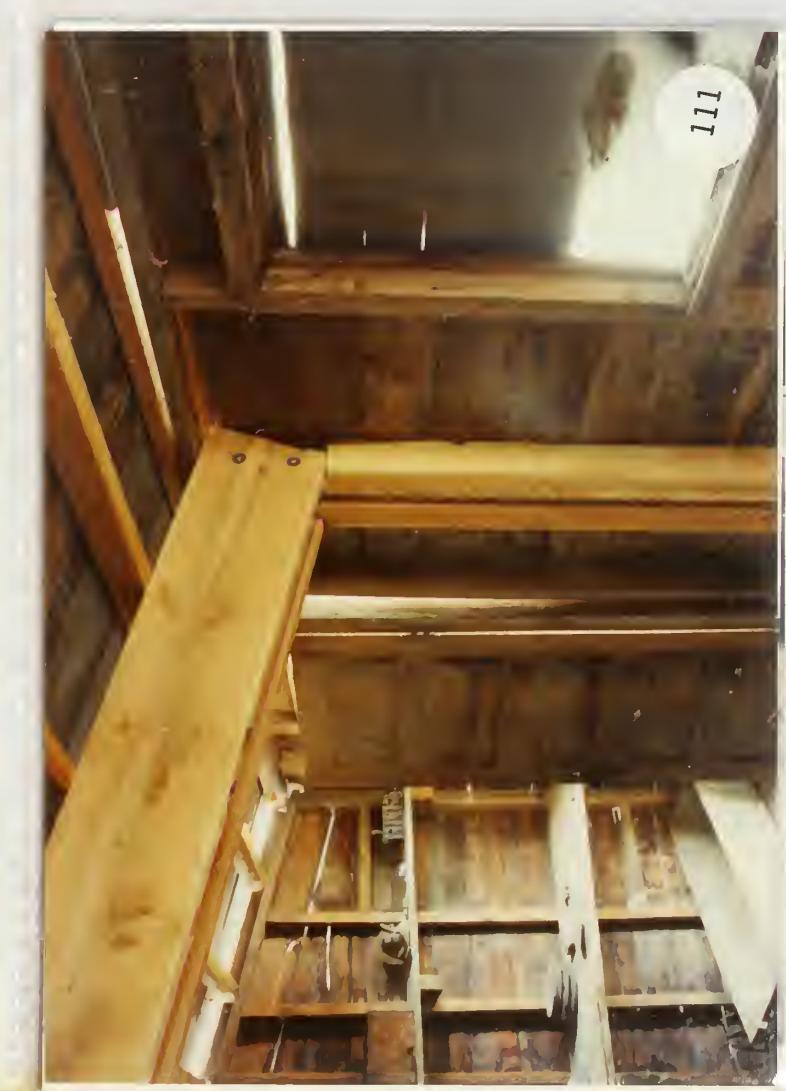
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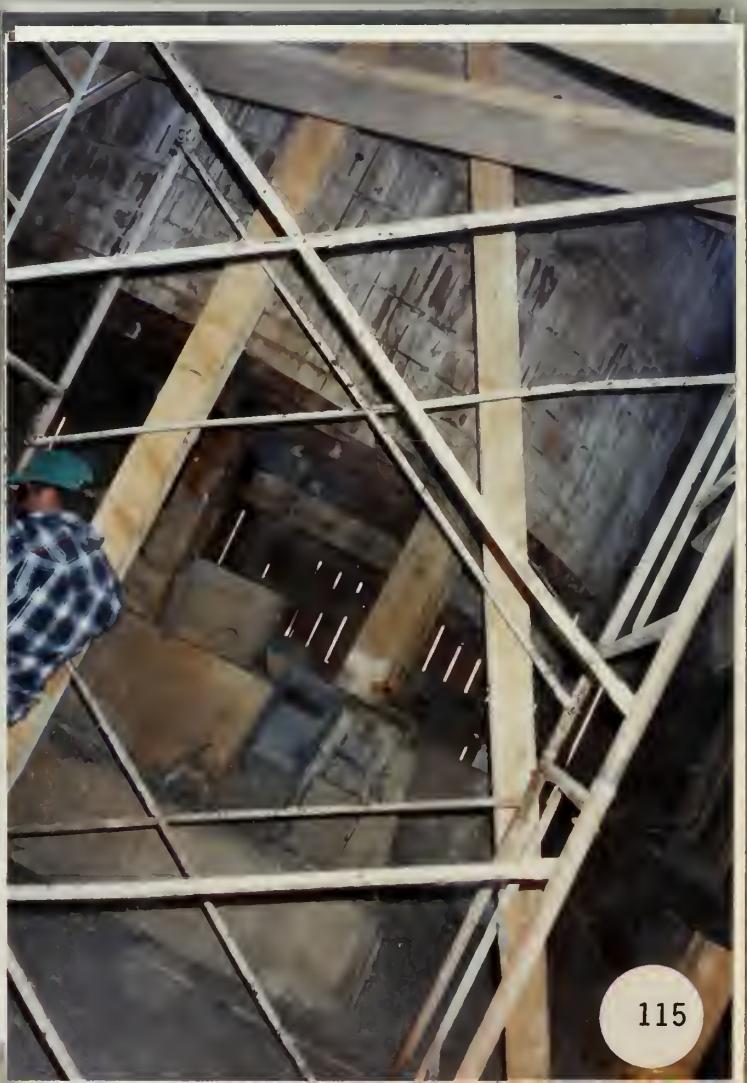
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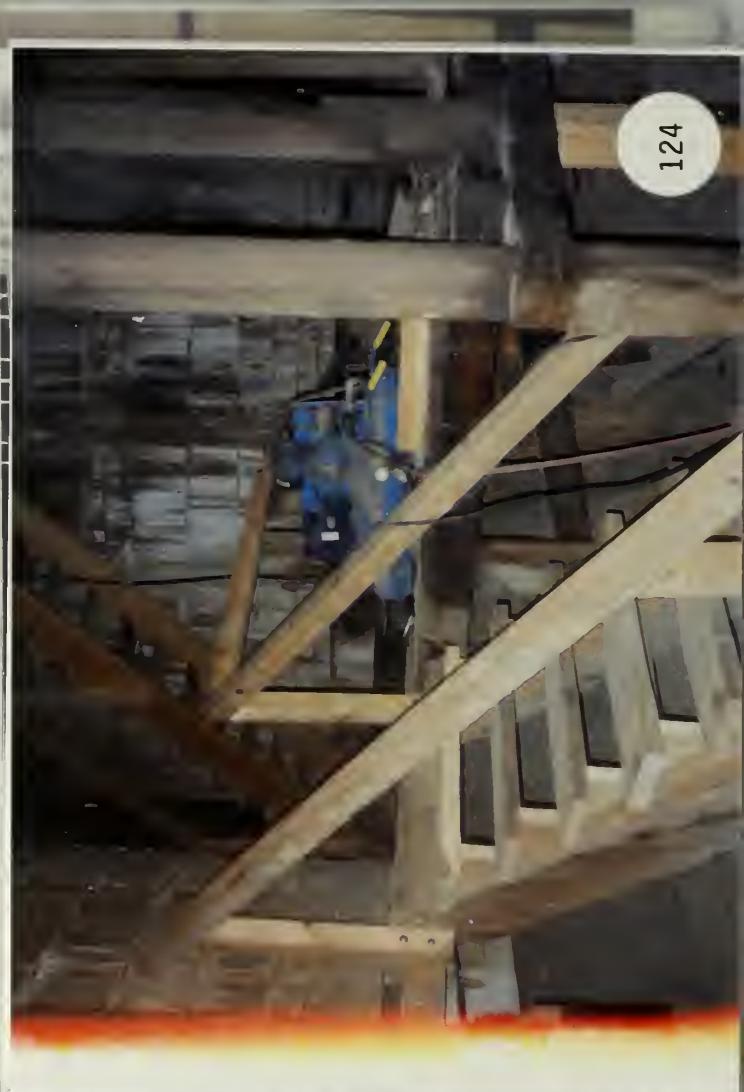
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BANNACK STATE PARK
QUAD: BANNACK, MT
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